PB90-234584

Final Response to BDAT Related Comments Document. D009, K044, K045 K047, D011, P119, P120, and P and U Wastes. Volume 1-I

(U.S.) Environmental Protection Agency, Washington, DC

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7. Author(s) Rosengrant/ Craig/OSW

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This background document provides the Agency's technical support and rationale for the development of treatment standards for the constituents to be regulated for the above-mentioned wastes.

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b. Identifiers/Open-Ended Terms

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FINAL
RESPONSE TO BDAT RELATED COMMENTS DOCUMENT

D009: Characteristic Wastes for Mercury and P and U Wastes Containing Mercury
K044, K045, and K047: Wastes from the Manufacturing and Processing of Explosives
D011: Characteristic Wastes for Silver
P119, P120: Vanadium Containing Wastes
and
P and U Wastes Containing Thallium

VOLUME I-I

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INTRODUCTION

This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters. This document is comprised of the following sections:

ISSUE CODE 1: General BDAT Aspects
ISSUE CODE 2: D001 - Characteristic Ignitable Wastes
ISSUE CODE 3: D002 - Characteristic Corrosive Wastes
ISSUE CODE 4: D003 - Characteristic Reactive Wastes and P and U Wastes Containing Reactive Listing Constituents
ISSUE CODE 5: D004/D010 - Characteristic Wastes for Arsenic and Selenium and K, P, and U Wastes Containing Arsenic and Selenium
ISSUE CODE 6: D005 - Characteristic Wastes for Barium and P013
ISSUE CODE 7: D006 - Characteristic Wastes for Cadmium
ISSUE CODE 8: D007 - Characteristic Wastes for Chromium
ISSUE CODE 9: D008 - Characteristic Wastes for Lead P and U Wastes Containing Lead
ISSUE CODE 10: D009 - Characteristic Wastes for Mercury P and U Wastes Containing Mercury
ISSUE CODE 11: K044, K045, K047: Wastes from the Manufacturing and Processing of Explosives
ISSUE CODE 12: D011 - Characteristic Wastes for Silver
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ISSUE CODE 14: P and U Wastes Containing Thallium
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ISSUE CODE 17: Halogenated Aliphatic U Wastes
ISSUE CODE 18: Non-halogenated Aromatic U Wastes
ISSUE CODE 19: F002-F005 - Solvents
ISSUE CODE 20: F006 - Electroplating WW Treatment Sludges
ISSUE CODE 21: F019 - Aluminum Conversion Coating Treatment Sludges
ISSUE CODE 22: F025 - Wastes from Production of Chlorinated Aliphatics
ISSUE CODE 23: K002-K008 - Inorganic Pigments

ISSUE CODE 24: K011/K013/K014 - Acrylonitrile

ISSUE CODE 25: K015 - Still Bottoms from Benzal Chloride

ISSUE CODE 26: K021 - Spent Antimony Catalyst.

(No Comments Were Received for this Waste Code)

ISSUE CODE 27: K046 - WW Treatment Sludges from Manufacturing, Formulating, and Loading of Lead-Based Initiating Compounds

ISSUE CODE 28: K060 - Ammonia Still Lime Sludge.

(No Comments Were Received for this Waste Code)

ISSUE CODE 29: K061 - Electric Arc Furnace Dust

ISSUE CODE 30: K069 - Emission Control Dust/Sludge from Secondary Lead Smelting

ISSUE CODE 31: K071, K106 - Mercury Cell Process Wastes

ISSUE CODE 32: K073 - Chlorinated Hydrocarbon Wastes.

(No Comments Were Received for this Waste Code)

ISSUE CODE 33: K086 - Residues from Ink Formulation

ISSUE CODE 34: K100 - Waste Leaching Solution from Acid Leaching of Emission Control Dust/Sludge from Secondary Lead Smelting

(No Comments Were Received for this Waste Code)

ISSUE CODE 35: Wastes Containing Cyanide

ISSUE CODE 36: K017 - Wastes from the production of Epichlorohydrin

(No Comments Were Received for this Waste Code)

ISSUE CODE 37: K028,K029, K095, K096 - Production of 1,1,1-Trichloroethane

ISSUE CODE 38: Wastewaters containing BDAT Constituents

ISSUE CODE 39: K022 - Wastes from the Production of Phenol/Acetone

ISSUE CODE 40: K025 - Distillation Bottoms from the Production of Nitrobenzene

ISSUE CODE 41: K035 - WW Treatment Sludges from the Production of Creosote

ISSUE CODE 42: K026 - Stripping Still Tails from the Production of Methyl Ethyl Pyridine

(No Comments Were Received for this Waste Code)

ISSUE CODE 43: K083 - Distillation Bottoms from the Production of Aniline

ISSUE CODE 44: Oxygenated Hydrocarbons and Heterocyclic U and P Wastes

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(No Comments Were Received for this Waste Code)

ISSUE CODE 50: K037

(No Comments Were Received for this Waste Code)

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ISSUE CODE 52: Gases

Commenters are identified by both commenter number and commenter name. Comments within each section of this document have been assigned a sequential comment number.

Issues were obtained from the original comment submittal and were categorized based on the grouping specified above. The Agency's response to each comment follows immediately after the text of the document. For responses related to capacity issues, the reader should review the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume II Capacity Related Comments." For information regarding broad policy questions, the reader is directed to the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume III Policy Related Comments."

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No Comments Were Received for this Waste Code

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ISSUE CODE 10: D009 - Characteristic Wastes for Mercury P and U Wastes Containing Mercury

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E.-.Alternative Treatment for "Debris" and Other Wastes
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G.-.Treatment Standard for Mixed Waste
H.-.Indigenous Waste

Comment Number: 10-A-1
Docket Number: L012-00050
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Data Submission
Comment:

HAZARDOUS WASTE TREATMENT COUNCIL

DATA SUBMISSION

FOR THE THIRD-THIRD PROPOSED RULE

I. INTRODUCTION

A series of investigations were undertaken to determine the suitability of BDAT standards proposed in the Third-Third rule in the November 22, 1989 Federal Register (54 FR 48372). This report presents those results.

A series of attachments which contain analytical data are included in this report. Each data set is identified by a load number. Table I presents the descriptions of the wastes for each load number as well as the parameters which were contained in the waste in significant quantities.

II. DISCUSSION OF QUALITY ASSURANCE

Samples of selected wastes were stabilized using proprietary reagents. These reagents are used to induce cementitious, siliceous and pozzolanic stabilization reactions. Solid wastes were first slurried with tap water to facilitate reaction with the reagents. Stabilized wastes are allowed to cure at least twenty-four hours prior to the TCLP extraction method (40 CFR 268, Appendix I).

One sample was duplicated and one extractor was filled only with extraction fluid (i.e. method blank) for each batch of twenty extractions . Filtered extracts were prepared for analysis using Method 3005. High purity acids were used in each preparation. Type II water was used for dilution.

Samples were analyzed using Method 6010, Inductively Coupled Argon Plasma Spectrometry (ICP). The ICP unit was calibrated using four points. Calibration was verified by reading a mid-level standard as a sample. Tolerance limits were ± 10 percent. A calibration blank was read as a sample and a digested quality control sample was analyzed. Acceptance limits for the QC samples were also ± 10 per cent.

Samples were then analyzed. One in every twenty samples was duplicated and spiked. Generally, duplicates were within 10 to 15 per cent difference. Spiked samples were recovered at 85 to 115 percent.

Comment Number: 10-A-1
Docket Number: L012-00050
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Data Submission
Comment:

1[illegible]-[illegible]-1

Method detection limits were measured and quantitated at the 99% confidence limit. Depending upon the individual sample, one of the following sets of method detection limits applies:

Element	Lab A	Lab B
Arsenic	0.112	0.100
Barium	0.010	0.010
Cadmium	0.009	0.010
Chromium	0.052	0.010
Lead	0.066	0.100
Mercury	0.0005	0.0005
Nickel	0.037	0.010
Selenium	0.154	0.100
Silver	0.014	0.010
Thallium	0.070	0.100

Note: all units are in mg/l

All QA/QC information is maintained and is available upon request.

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TABLE I (continued)

WASTE DESCRIPTIONS

Load	Parameters	Waste Description
5999	Ni	solid film disposition waste from the semi-conductor industry
4602	Ni, Cr	chromic anodize solution from surface finishing in the aerospace industry
6264A	Hg	contaminated soils from the natural gas pipe line industry
5404B	Ni, Cr	mixed metal chips from machining operations in the aerospace industry
4497B	Ni, Ba, Cr	sodium flouride/metal sludge from the metal forming and waste water treatment plant plant in the aerospace industry
6372I	Ni, Ba, Pb Cr	zinc ammonium chloride solids from the manufacturing of containers
4342 4455 4343	Ni, Ba, Pb	soil contaminated with lead and petroleum from a leaking underground storage tank
6243B	Ba	paint residue
3768A 6257 3743A	Ba, Hg	debris contaminated with mercury from the gas pipeline industry
4467B	Ba, Pb, Cr	incinerator flyash from the aerospace industry
3889	Pb, Cr	sump sludge from reconditioning of metal drums
5029A	Pb, Cr	ammonium hydroxide waste from electroplating

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VIII. Mercury

The data base was sorted for those values of mercury in the untreated waste in excess of 1.0 mg/kg. These data are present in Attachment F.

TCLP Number 11-08-89-D12 Load Number 3743A
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.1
2	Barium	57.5	1.33
3	Cadmium	0.5	0.01
4	Chromium	25	0.08
5	Lead	5	0.1
6	Mercury	89	0.0546
7	Nickel	0.5	0.01
8	Selenium	5	0.1
9	Silver	0.5	0.01
10	Thallium	5	0.1

Waste Mass	100	Comp 1 Mass 100	Component 1 [redacted]
		Comp 2 Mass 4	Component 2 [redacted]
		Comp 3 Mass 10	Component 3 [redacted]
		Comp 4 Mass 150	Component 4 [redacted]

Final Volume 150 Initial Volume 100 Volume Increase 1.5

TCLP Number 11-28-89-D04 Load Number 3743A
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.294
2	Barium	57.5	1.55
3	Cadmium	0.5	0.009
4	Chromium	25	0.057
5	Lead	5	0.161
6	Mercury	89	0.04
7	Nickel	0.5	0.159
8	Selenium	5	0.154
9	Silver	0.5	0.014
10	Thallium	5	0.07

Waste Mass	102.6	Comp 1 Mass 100.1	Component 1 [redacted]
		Comp 2 Mass 1	Component 2 [redacted]
		Comp 3 Mass 220.6	Component 3 [redacted]
		Comp 4 Mass 55.2	Component 4 [redacted]

Final Volume 380 Initial Volume 100 Volume Increase 3.8

Comment Number: 10-A-1
Docket Number: LD12-00050
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Data Submission
Comment:

TCLP Number 11-28-89-D11 Load Number 3768A
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.232
2	Barium	291	1.37
3	Cadmium	0.5	0.009
4	Chromium	18	0.76
5	Lead	5	0.172
6	Mercury	33.9	0.04
7	Nickel	0.5	0.172
8	Selenium	5	0.179
9	Silver	0.5	0.014
10	Thallium	5	0.122

Waste Mass	100.4	Comp 1 Mass 100.1	Component 1 [redacted]
		Comp 2 Mass 1	Component 2 [redacted]
		Comp 3 Mass 180	Component 3 [redacted]
		Comp 4 Mass 45	Component 4 [redacted]

Final Volume 370 Initial Volume 100 Volume Increase 3.7

TCLP Number 11-08-89-D13 Load Number 3768A
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.1
2	Barium	291	1.43
3	Cadmium	0.5	0.01
4	Chromium	18	0.06
5	Lead	5	0.1
6	Mercury	33.9	0.0744
7	Nickel	0.5	0.01
8	Selenium	5	0.1
9	Silver	0.5	0.01
10	Thallium	5	0.1

Waste Mass	100	Comp 1 Mass 100	Component 1 [redacted]
		Comp 2 Mass 4	Component 2 [redacted]
		Comp 3 Mass 10	Component 3 [redacted]
		Comp 4 Mass 150	Component 4 [redacted]

Final Volume 150 Initial Volume 100 Volume Increase 1.5

Comment Number: 10-A-1
Docket Number: LD12-00050
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Data Submission
Comment:

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TCLP Number 11-02-89-D10
[redacted]              Waste Code 1 D009       Load Number 6264A
  #      Metal                                  2          3
  1      Arsenic                          Total                  4
  2      Barium                           5                      Stabilized
  3      Cadmium                          48.5
  4      Chromium                         0.5
  5      Lead                             6                      0.01
  6      Mercury                          5                      0.1
  7      Nickel                           26                     0.1
  8      Selenium                         0.5
  9      Silver                           5                      0.01
 10      Thallium                         0.5
                                          5                      0.01

Waste
Mass     100          Comp 1 Mass 100       Component 1 [redacted]
                      Comp 2 Mass 4         Component 2 [redacted]
                      Comp 3 Mass 10        Component 3 [redacted]
                      Comp 4 Mass 214       Component 4 [redacted]
Final Volume     220        Initial Volume       80        Volume Increase  2.75

TCLP Number 11-27-89-D21
[redacted]              Waste Code 1 D009  2    Load Number 6264A
  #      Metal                                         3
  1      Arsenic                          Total                  4
  2      Barium                           5                      Stabilized
  3      Cadmium                          48.5                   0.112
  4      Chromium                         0.5                    0.673
  5      Lead                             6                      0.009
  6      Mercury                          5                      0.052
  7      Nickel                           26                     0.078
  8      Selenium                         0.5                    0.03
  9      Silver                           5                      0.037
 10      Thallium                         0.5                    0.154
                                          5                      0.014
                                                                 0.07

Waste
Mass     100.8        Comp 1 Mass 100.2     Component 1 [redacted]
                      Comp 2 Mass 0.96      Component 2 [redacted]
                      Comp 3 Mass 146.2     Component 3 [redacted]
                      Comp 4 Mass 36.52     Component 4 [redacted]
Final Volume     250        Initial Volume       100       Volume Increase  2.5
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Comment Number: 10-A-1
Docket Number: LD12-00050
Commenter: Hagardous Waste Treatment Council
Issue: Mercury—Characteristic Waste (D009)
Subissue: Data Submission
Comment:

TCLP Number 11-27-89-D12 Load Number 6257
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.112
2	Barium	280	1.01
3	Cadmium	0.5	0.009
4	Chromium	4.2	0.052
5	Lead	17	0.085
6	Mercury	24.2	0.04
7	Nickel	0.5	0.037
8	Selenium	5	0.154
9	Silver	0.5	0.014
10	Thallium	5	0.07

Waste Mass 101	Comp 1 Mass 99.95	Component 1	[redacted]
	Comp 2 Mass 1.02	Component 2	[redacted]
	Comp 3 Mass 153.1	Component 3	[redacted]
	Comp 4 Mass 38.29	Component 4	[redacted]

Final Volume 300 Initial Volume 100 Volume Increase 3

TCLP Number 11-01-89-D08 Load Number 6257
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	5	0.1
2	Barium	280	1.42
3	Cadmium	0.5	0.01
4	Chromium	4.2	0.08
5	Lead	17	0.01
6	Mercury	24.2	0.167
7	Nickel	0.5	0.01
8	Selenium	5	0.1
9	Silver	0.5	0.01
10	Thallium	5	0.1

Waste Mass 100	Comp 1 Mass 100	Component 1	[redacted]
	Comp 2 Mass 4	Component 2	[redacted]
	Comp 3 Mass 10	Component 3	[redacted]
	Comp 4 Mass 153	Component 4	[redacted]

Final Volume 200 Initial Volume 80 Volume Increase 2.5

Comment Number: 10-A-1
Docket Number: L012-00050
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Data Submission
Comment:

XI. TCLP Performed on Untreated Waste

Appendix I contains data from TCLP analyses on untreated waste. This data has been compared with the total concentration of metal and the stabilized TCLP values in order to determine if stabilization reduces actual mobility of the waste constituents. This data is summarized in Table II.

TABLE II

RELATIONSHIP BETWEEN TOTAL CONCENTRATION, UNTREATED TCLP AND STABILIZED TCLP OF SELECTED WASTES

Load	Element	untrtd Tot (mg/kg)	untrtd TCLP (mg/l)	trtd TCLP (mg/l)
4342	Pb	29	6.01	0.1
6257	Ba	580	2.41 2.38	1.42 1.01
4497B	Ba	68.5	1.98	1.46
	Cr	1660	1.66	0.12
	Ni	55.6	3.52	0.01
4467B	Ba	158	1.09	0.859
	Pb	810	0.749	0.273
	Cr	48.7	0.096	0.061
5404	Cr	3100	4.42	0.01
	Ni	128	2.21	0.01
	Th	236	0.409	0.1
6316A	Ni	4760	65.3	0.06
6243	Ba	1390	353	12.32
4322	As	23.6	2.26 4.65	0.112
	Ba	104	0.481	0.246
	Pb	130	1.27	0.083
	Ni	3960	108 216	5.31
	Se	5	2.97	0.154
6319	Cr	454	0.106	0.06
	Pb	36	0.515	0.1
6377	As	602	409	0.329

COMMENT NUMBER: 10-A-1
DOCKET NUMBER: LD12-00050
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Data Submission
RESPONSE:

EPA thanks the Hazardous Waste Treatment Council (HWTC) for providing the results of a series of investigations into the feasibility of commercial stabilization techniques for several D009 wastes. A subsequent comment submitted to EPA by HWTC references the results of these investigations. EPA's response to this latter comment is provided under comment response number 10-D-1.

Comment Number: 10-B-1
Docket Number: L012-00069
Commenter: Rayovac Corporation
Issue: Mercury-Characteristic Waste (D009)
Subissue: Thermal Recovery Standard: DEMONSTRATABILITY
Comment:

The EPA proposes to require retorting for high mercury wastes (i.e., 16 mg./kg. or higher) and acid leaching for low mercury wastes (i.e., less than 16 mg./kg.); 54 FR 48440. While the numerical limit selected, 16 mg./kg., may be an appropriate lower limit for retorting of cinnabar, it may not be the appropriate lower limit for any of the many different man-made wastes. The EPA's regulations should be flexible enough to permit the most appropriate technology (e.g., retorting, acid leaching, or something else) for each man-made mercury containing waste, and should not dictate the same technology for all purposes based simply on what works satisfactorily for cinnabar.

COMMENT NUMBER: 10-B-1
DOCKET NUMBER: LD12-00069
COMMENTER: RAYOVAC CORPORATION
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

This commenter, as well as others, believes that thermal recovery has not been adequately demonstrated for high mercury content wastes. The commenter's argument is based, to a large extent, on the results of a recent study entitled, "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" that was prepared for The Chlorine Institute by PEI Associates. This study reported significant operational problems and poor elemental mercury recovery when pilot scale retorting experiments of K106 wastes were conducted. The operational problems reported included poor control of temperature in the reaction zone resulting in glazing and agglomeration of the waste and particulate carryover into downstream recovery equipment. Several commenters have attributed the poor results to the high concentration of chloride salts present in K106 that likely interfere with the overall performance.

EPA has carefully reviewed this PEI study and the various comments submitted to EPA concerning the significance of the findings of the report. EPA has determined that the operational and recovery problems experienced can likely be attributed to inadequate furnace design, operational controls, and recovery system design.

Although EPA recognizes that chloride salts can interfere with the performance of the retorter/roaster, EPA also recognizes that their effect can be minimized and controlled through close control of residence time and

COMMENT NUMBER:	10-B-1 (continued)
DOCKET NUMBER:	LD12-00069
COMMENTER:	RAYOVAC CORPORATION
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Thermal Recovery Standard: Demonstrability
RESPONSE:	

temperature within the retort unit. Retorting of a mixed waste comprised of 5 percent K106 and 95 percent K071 has been demonstrated in Perry (1974) (see Background Document for full citation). EPA believes that since it is demonstrated that mercury can be removed from this feed material, which has a higher concentration of chloride salts (due to the K071 waste) than pure K106, then chloride salts can be prevented from becoming a source of major performance impairment. In addition, Perry (1974) reported that acid pretreating the sludge prior to retorting increased the mercury removal from the waste. The study results indicate that pretreating the waste can improve its amenability to treatment.

The PEI study utilized a rotary kiln furnace for retorting. Perry (1974) also had experimented with a rotary kiln furnace but switched to a multiple hearth furnace because it provided better control over residence time and eliminated short ciruiting problems. Similarly, the McDermitt Mine utilizes a multiple hearth furnace to roast cinnabar (HgS) ores for mercury recovery (USEPA 1989d) and a multiple hearth furnace is used for recovery of mercury from roasting of copper sulfide ores containing 3,700 t0 15,000 mg/kg mercury (Marshal, undated). Also, unlike the PEI pilot plant study, these full-scale plants successfully recover(ed) mercury from their feed materials. All three facilities designed their mercury recovery systems with the mercury condenser(s) between the dust cyclone and the scrubber system not after the scrubber system

COMMENT NUMBER: 10-B-1 (continued)
DOCKET NUMBER: LD12-00069
COMMENTER: RAYOVAC CORPORATION
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

as was done in the PEI pilot study. PEI provided no details on the design of the actual condenser unit. However, considering the placement of the unit in the recovery system, it is not surprising that no mercury was recovered.

For this final rule, EPA has determined that thermal recovery has been demonstrated for mercury wastes containing mercury at concentrations as low as 260 mg/kg. This revised cutoff standard is based on the lowest mercury concentration in untreated wastes that have been retorted successfully to recover mercury (Perry 1974). In Perry (1974), mercury was recovered from a system that used 5 percent K106 and 95 percent K071 as the feed material. Perry (1974) reported mercury removals from the feed material ranging from 98.3 to 99.8 percent. Perry (1974) reported that over 90 percent of the mercury was recovered, and that improvements to the gas scrubbing system would be expected to improve the recovery.

Comment Number: 10-B-2
Docket Number: LD12-00258
Commenter: AKZO CHEMICALS INC.
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: THERMAL RECOVERY STANDARD: DEMONSTRATABILITY
Comment:

From the participation of the Akzo LeMoyne Chlorine Plant in the Chlorine Institute sponsored Mercury Containing Wastes Task Group (MCWTG) and the resultant K106 Retort Study conducted by PEI Associates, Inc. , as well as discussions held with Chlorine Institute members with previous retorting experience; the following problems associated with retorting mercury containing non-wastewaters classified as K071, K106 and D009 are noted. The "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" by PEI Associates, Inc., has been submitted by the Chlorine Institute during the comment period for the proposed Land Disposal Restrictions for Third Scheduled Wastes.

Mercury recovery from low level mercury concentrated feeds is difficult – As currently proposed retorting would be required for K071, K106 and D009 non-wastewaters above 16 mg/kg total mercury. However, all of the data used by the EPA to demonstrate retorting was based on mercury feed concentrations much higher than 16 mg/kg. The data used by the EPA ranged from 738,000 mg/kg (McDermott cinnubar ores) to 255 mg/kg (mixed K071/K106) mercury feed concentrations.

The Chlorine Institute K106 Retort Study used actual K106 wastes from three different member companies with mercury feed concentrations ranging from 171,000 mg/kg to 2,550 mg/kg. This K106 Retort Study showed that mercury recovery even at these levels is difficult as no elemental mercury was recovered from any of the runs performed during this study.

COMMENT NUMBER: 10-B-2
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

This commenter, as well as others, believes that thermal recovery has not been adequately demonstrated for high mercury content wastes. The commenter's argument is based, to a large extent, on the results of a recent study entitled, "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" that was prepared for The Chlorine Institute by PEI Associates. This study reported significant operational problems and poor elemental mercury recovery when pilot scale retorting experiments of K106 wastes were conducted. The operational problems reported included poor control of temperature in the reaction zone resulting in glazing and agglomeration of the waste and particulate carryover into downstream recovery equipment. Several commenters have attributed the poor results to the high concentration of chloride salts present in K106 that likely interfere with the overall performance.

EPA has carefully reviewed this PEI study and the various comments submitted to EPA concerning the significance of the findings of the report. EPA has determined that the operational and recovery problems experienced can likely be attributed to inadequate furnace design, operational controls, and recovery system design.

Although EPA recognizes that chloride salts can interfere with the performance of the retorter/roaster, EPA also recognizes that their effect can be minimized and controlled through close control of residence time and

COMMENT NUMBER: 10-B-2 (continued)
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

temperature within the retort unit. Retorting of a mixed waste comprised of 5 percent K106 and 95 percent K071 has been demonstrated in Perry (1974) (see Background Document for full citation). EPA believes that since it is demonstrated that mercury can be removed from this feed material, which has a higher concentration of chloride salts (due to the K071 waste) than pure K106, then chloride salts can be prevented from becoming a source of major performance impairment. In addition, Perry (1974) reported that acid pretreating the sludge prior to retorting increased the mercury removal from the waste. The study results indicate that pretreating the waste can improve its amenability to treatment.

The PEI study utilized a rotary kiln furnace for retorting. Perry (1974) also had experimented with a rotary kiln furnace but switched to a multiple hearth furnace because it provided better control over residence time and eliminated short ciruiting problems. Similarly, the McDermitt Mine utilizes a multiple hearth furnace to roast cinnabar (HgS) ores for mercury recovery (USEPA 1989d) and a multiple hearth furnace is used for recovery of mercury from roasting of copper sulfide ores containing 3,700 to 15,000 mg/kg mercury (Marshal, undated). Also, unlike the PEI pilot plant study, these full-scale plants successfully recover(ed) mercury from their feed materials. All three facilities designed their mercury recovery systems with the mercury condenser(s) between the dust cyclone and the scrubber system not after the scrubber system

COMMENT NUMBER: 10-B-2 (continued)
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

as was done in the PEI pilot study. PEI provided no details on the design of the actual condenser unit. However, considering the placement of the unit in the recovery system, it is not surprising that no mercury was recovered.

For this final rule, EPA has determined that thermal recovery has been demonstrated for mercury wastes containing mercury at concentrations as low as 260 mg/kg. This revised cutoff standard is based on the lowest mercury concentration in untreated wastes that have been retorted successfully to recover mercury (Perry 1974). In Perry (1974), mercury was recovered from a system that used 5 percent K106 and 95 percent K071 as the feed material. Perry (1974) reported mercury removals from the feed material ranging from 98.3 to 99.8 percent. Perry (1974) reported that over 90 percent of the mercury was recovered, and that improvements to the gas scrubbing system would be expected to improve the recovery.

Comment Number: 10-B-3
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: THERMAL RECOVERY STANDARD: DEMONSTRATABILITY
Comment:

3. Mercury recovery from wastes containing low concentrations of mercury is difficult. Thermal treatment has not been adequately demonstrated as a recovery methodology for K106, K071 and D009 wastes.

> The only example of thermal "treatment" cited in the Background Document where recovery of mercury occurs is the McDermitt Mine retort. However, the feed stock there was highly concentrated. In addition, no data is available to show how much mercury was lost to other media during the recovery process. No other examples of actual mercury recovery are provided by EPA.
>
> As currently proposed, retorting would be required for K071, K106 and D009 non-wastewaters above .16 mg/kg total mercury. However, all of the data used by the EPA to demonstrate retorting was based on mercury feed concentrations much higher than 16 mg/kg. The data used by the EPA ranged from 738,000 Mg/kg (McDermitt cinnabar ores) to 255 mg/kg (mixed K071/-D106 mercury feed concentrations.) No recovery was reported at the 255 mg/kg feed concentration.

The Chlorine Institute K106 Retort Study used actual K106 wastes from three different member companies with mercury feed concentrations ranging from 171,000 mg/kg to 2,550 mg/kg. This K106 Retort Study showed that mercury recovery even at these levels is extremely difficult as no elemental mercury was recovered from any of the runs performed during this study.

COMMENT NUMBER: 10-B-3
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

This commenter, as well as others, believes that thermal recovery has not been adequately demonstrated for high mercury content wastes. The commenter's argument is based, to a large extent, on the results of a recent study entitled, "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" that was prepared for The Chlorine Institute by PEI Associates. This study reported significant operational problems and poor elemental mercury recovery when pilot scale retorting experiments of K106 wastes were conducted. The operational problems reported included poor control of temperature in the reaction zone resulting in glazing and agglomeration of the waste and particulate carryover into downstream recovery equipment. Several commenters have attributed the poor results to the high concentration of chloride salts present in K106 that likely interfere with the overall performance.

EPA has carefully reviewed this PEI study and the various comments submitted to EPA concerning the significance of the findings of the report. EPA has determined that the operational and recovery problems experienced can likely be attributed to inadequate furnace design, operational controls, and recovery system design.

Although EPA recognizes that chloride salts can interfere with the performance of the retorter/roaster, EPA also recognizes that their effect can be minimized and controlled through close control of residence time and

COMMENT NUMBER: 10-B-3 (continued)
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

temperature within the retort unit. Retorting of a mixed waste comprised of 5 percent K106 and 95 percent K071 has been demonstrated in Perry (1974) (see Background Document for full citation). EPA believes that since it is demonstrated that mercury can be removed from this feed material, which has a higher concentration of chloride salts (due to the K071 waste) than pure K106, then chloride salts can be prevented from becoming a source of major performance impairment. In addition, Perry (1974) reported that acid pretreating the sludge prior to retorting increased the mercury removal from the waste. The study results indicate that pretreating the waste can improve its amenability to treatment.

The PEI study utilized a rotary kiln furnace for retorting. Perry (1974) also had experimented with a rotary kiln furnace but switched to a multiple hearth furnace because it provided better control over residence time and eliminated short ciruiting problems. Similarly, the McDermitt Mine utilizes a multiple hearth furnace to roast cinnabar (HgS) ores for mercury recovery (USEPA 1989d) and a multiple hearth furnace is used for recovery of mercury from roasting of copper sulfide ores containing 3,700 t0 15,000 mg/kg mercury (Marshal, undated). Also, unlike the PEI pilot plant study, these full-scale plants successfully recover(ed) mercury from their feed materials. All three facilities designed their mercury recovery systems with the mercury condenser(s) between the dust cyclone and the scrubber system not after the scrubber system

COMMENT NUMBER: 10-B-3 (continued)
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

as was done in the PEI pilot study. PEI provided no details on the design of the actual condenser unit. However, considering the placement of the unit in the recovery system, it is not surprising that no mercury was recovered.

For this final rule, EPA has determined that thermal recovery has been demonstrated for mercury wastes containing mercury at concentrations as low as 260 mg/kg. This revised cutoff standard is based on the lowest mercury concentration in untreated wastes that have been retorted successfully to recover mercury (Perry 1974). In Perry (1974), mercury was recovered from a system that used 5 percent K106 and 95 percent K071 as the feed material. Perry (1974) reported mercury removals from the feed material ranging from 98.3 to 99.8 percent. Perry (1974) reported that over 90 percent of the mercury was recovered, and that improvements to the gas scrubbing system would be expected to improve the recovery.

Comment Number: 10-B-4
Docket Number: LD12-00251
Commenter: BF GOODRICH
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: THERMAL RECOVERY STANDARD: DEMONSTRATABILITY
Comment:

Mercury recovery from waste containing low concentrations of mercury is difficult and thermal treatment has not been demonstrated adequately as a recovery for K-106, K-071, and D-009 wastes.

The only example of thermal "treatment" cited in the Background Document where recovery of mercury occurs is the McDermitt Mine retort; however, the feed stock was highly concentrated. In addition, no data are available to show how much mercury was lost to other media during the recovery process. No other) examples of actual mercury recovery are given.

As currently proposed, retorting would be required for K-071, K-106 and D-009 non-wastewaters above 16 mg/kg total mercury. However, all of the data used by the EPA to demonstrate retorting were based on mercury feed concentrations much higher than 16 mg/kg. The data used by the EPA ranged from 738,000 mg/kg (McDermitt cinnabar ores) to 255 mg/kg (mixed K-071 - K-106) mercury feed concentrations.

The Chlorine Institute K-106 Retort Study used actual K-106 wastes from three different member companies with mercury feed concentrations ranging from 171,000 mg/kg to 2,550 mg/kg. This K-106 Retort Study showed that mercury recovery even at these levels is extremely difficult as no elemental mercury was recovered from any of the runs performed during this study.

COMMENT NUMBER: 10-B-4
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

This commenter, as well as others, believes that thermal recovery has not been adequately demonstrated for high mercury content wastes. The commenter's argument is based, to a large extent, on the results of a recent study entitled, "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" that was prepared for The Chlorine Institute by PEI Associates. This study reported significant operational problems and poor elemental mercury recovery when pilot scale retorting experiments of K106 wastes were conducted. The operational problems reported included poor control of temperature in the reaction zone resulting in glazing and agglomeration of the waste and particulate carryover into downstream recovery equipment. Several commenters have attributed the poor results to the high concentration of chloride salts present in K106 that likely interfere with the overall performance.

EPA has carefully reviewed this PEI study and the various comments submitted to EPA concerning the significance of the findings of the report. EPA has determined that the operational and recovery problems experienced can likely be attributed to inadequate furnace design, operational controls, and recovery system design.

Although EPA recognizes that chloride salts can interfere with the performance of the retorter/roaster, EPA also recognizes that their effect can be minimized and controlled through close control of residence time and

COMMENT NUMBER: 10-B-4 (continued)
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

temperature within the retort unit. Retorting of a mixed waste comprised of 5 percent K106 and 95 percent K071 has been demonstrated in Perry (1974) (see Background Document for full citation). EPA believes that since it is demonstrated that mercury can be removed from this feed material, which has a higher concentration of chloride salts (due to the K071 waste) than pure K106, then chloride salts can be prevented from becoming a source of major performance impairment. In addition, Perry (1974) reported that acid pretreating the sludge prior to retorting increased the mercury removal from the waste. The study results indicate that pretreating the waste can improve its amenability to treatment.

The PEI study utilized a rotary kiln furnace for retorting. Perry (1974) also had experimented with a rotary kiln furnace but switched to a multiple hearth furnace because it provided better control over residence time and eliminated short ciruiting problems. Similarly, the McDermitt Mine utilizes a multiple hearth furnace to roast cinnabar (HgS) ores for mercury recovery (USEPA 1989d) and a multiple hearth furnace is used for recovery of mercury from roasting of copper sulfide ores containing 3,700 t0 15,000 mg/kg mercury (Marshal, undated). Also, unlike the PEI pilot plant study, these full-scale plants successfully recover(ed) mercury from their feed materials. All three facilities designed their mercury recovery systems with the mercury condenser(s) between the dust cyclone and the scrubber system not after the scrubber system

COMMENT NUMBER: 10-B-4 (continued)

DOCKET NUMBER: LD12-00251

COMMENTER: B.F. GOODRICH

ISSUE: Mercury Characteristic Waste (D009)

SUBISSUE: Thermal Recovery Standard: Demonstrability

RESPONSE:

as was done in the PEI pilot study. PEI provided no details on the design of the actual condenser unit. However, considering the placement of the unit in the recovery system, it is not surprising that no mercury was recovered.

For this final rule, EPA has determined that thermal recovery has been demonstrated for mercury wastes containing mercury at concentrations as low as 260 mg/kg. This revised cutoff standard is based on the lowest mercury concentration in untreated wastes that have been retorted successfully to recover mercury (Perry 1974). In Perry (1974), mercury was recovered from a system that used 5 percent K106 and 95 percent K071 as the feed material. Perry (1974) reported mercury removals from the feed material ranging from 98.3 to 99.8 percent. Perry (1974) reported that over 90 percent of the mercury was recovered, and that improvements to the gas scrubbing system would be expected to improve the recovery.

Comment Number: 10-B-5
Docket Number: LD12-00132
Commenter: THE CHLORINE INSTITUTE
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: THERMAL RECOVERY STANDARD: DEMONSTRATABILITY
Comment:

Mercury recovery from wastes containing low concentrations of mercury is difficult and thermal treatment has not been adequately demonstrated as a recovery for K106, K071, and D009 wastes.

- The only example of thermal "treatment" cited in the Background Document where recovery of mercury occurs is the McDermitt Mine retort. However, the feed stock was highly concentrated. In addition, no data is available to show how much mercury was lost to other media during the recovery process. No other examples of actual mercury recovery are given.

- As currently proposed retorting would be required for K071, K106 and D009 nonwastewaters above 16 mg/kg total mercury. However, all of the data used by the EPA to demonstrate retorting was based on mercury feed concentrations much higher than 16 mg/kg. The data used by the EPA ranged from 738,000 mg/kg (McDermitt cinnabar ores) to 255 mg/kg (mixed K071/K106) mercury feed concentrations.

The Chlorine Institute K106 Retort Study used actual K106 wastes from three different member companies with mercury feed concentrations ranging from 171,000 mg/kg to 2,550 mg/kg. This K106 Retort Study showed that mercury recovery even at these levels is extremely difficult as no elemental mercury was recovered from any of the runs performed during this study.

COMMENT NUMBER: 10-B-5
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

This commenter, as well as others, believes that thermal recovery has not been adequately demonstrated for high mercury content wastes. The commenter's argument is based, to a large extent, on the results of a recent study entitled, "Test Results for Thermal Desorption Treatment of K106 Chlorine Production Waste" that was prepared for The Chlorine Institute by PEI Associates. This study reported significant operational problems and poor elemental mercury recovery when pilot scale retorting experiments of K106 wastes were conducted. The operational problems reported included poor control of temperature in the reaction zone resulting in glazing and agglomeration of the waste and particulate carryover into downstream recovery equipment. Several commenters have attributed the poor results to the high concentration of chloride salts present in K106 that likely interfere with the overall performance.

EPA has carefully reviewed this PEI study and the various comments submitted to EPA concerning the significance of the findings of the report. EPA has determined that the operational and recovery problems experienced can likely be attributed to inadequate furnace design, operational controls, and recovery system design.

Although EPA recognizes that chloride salts can interfere with the performance of the retorter/roaster, EPA also recognizes that their effect can be minimized and controlled through close control of residence time and

COMMENT NUMBER: 10-B-5 (continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

temperature within the retort unit. Retorting of a mixed waste comprised of 5 percent K106 and 95 percent K071 has been demonstrated in Perry (1974) (see Background Document for full citation). EPA believes that since it is demonstrated that mercury can be removed from this feed material, which has a higher concentration of chloride salts (due to the K071 waste) than pure K106, then chloride salts can be prevented from becoming a source of major performance impairment. In addition, Perry (1974) reported that acid pretreating the sludge prior to retorting increased the mercury removal from the waste. The study results indicate that pretreating the waste can improve its amenability to treatment.

The PEI study utilized a rotary kiln furnace for retorting. Perry (1974) also had experimented with a rotary kiln furnace but switched to a multiple hearth furnace because it provided better control over residence time and eliminated short ciruiting problems. Similarly, the McDermitt Mine utilizes a multiple hearth furnace to roast cinnabar (HgS) ores for mercury recovery (USEPA 1989d) and a multiple hearth furnace is used for recovery of mercury from roasting of copper sulfide ores containing 3,700 t0 15,000 mg/kg mercury (Marshal, undated). Also, unlike the PEI pilot plant study, these full-scale plants successfully recover(ed) mercury from their feed materials. All three facilities designed their mercury recovery systems with the mercury condenser(s) between the dust cyclone and the scrubber system not after the scrubber system

COMMENT NUMBER: 10-B-5 (continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Thermal Recovery Standard: Demonstrability
RESPONSE:

as was done in the PEI pilot study. PEI provided no details on the design of the actual condenser unit. However, considering the placement of the unit in the recovery system, it is not surprising that no mercury was recovered.

For this final rule, EPA has determined that thermal recovery has been demonstrated for mercury wastes containing mercury at concentrations as low as 260 mg/kg. This revised cutoff standard is based on the lowest mercury concentration in untreated wastes that have been retorted successfully to recover mercury (Perry 1974). In Perry (1974), mercury was recovered from a system that used 5 percent K106 and 95 percent K071 as the feed material. Perry (1974) reported mercury removals from the feed material ranging from 98.3 to 99.8 percent. Perry (1974) reported that over 90 percent of the mercury was recovered, and that improvements to the gas scrubbing system would be expected to improve the recovery.

Comment Number: 10-C-1
Docket Number: LD12-00128
Commenter: Vulcan Chemicals
Issue: Mercury - Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

As to the treatment standard for D009 mercury-containing wastes, EPA has proposed a mercury level for all treated D009 nonwastewaters of 0.025 mg/L and for all treated D009 wastewaters of 0.030 mg/L. Both are substantially below the characteristic level of 0.200 mg/L.[p.48441] As noted above, Vulcan does not believe it is appropriate to establish a treatment standard below the characteristic level of a given waste. Any waste containing mercury below 0.200 mg/L is not considered a characteristic hazardous waste, based on its mercury concentration. Therefore, it is not reasonable to "require" a treatment standard below the characteristic level. Should the treatment process result in a residue which has a mercury level below the characteristic level, this is a fortuitous side-effect of the treatment process, but the hazardous waste treatment operatcr should not be "required" to treat mercury waste to levels below the characteristic level.

COMMENT NUMBER: 10-C-1
DOCKET NUMBER: LD12-00128
COMMENTER: VULCAN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level
RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach.

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate.

Comment Number: 10-C-2

Docket Number: L012-00129

Commenter: Olin Chemicals

Issue: Mercury - Characteristic Waste (D009)

Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level

Comment:

Olin recommends that the proposed high and low total mercury subcategories of D009 waste be eliminated. The sole criteria for BDAT treatment requirement should be an extractable 0.2 mg/l or greater mercury in leachate as defined by the EP toxicity or TCLP tests. Land burial of D009 as generated should be considered satisfactory unless a specific BDAT standard is identified for a specific D009 waste. Olin contends that it is improper to establish BDAT standards at concentration levels below the level (0.2 mg/l) utilized to define a characteristic waste.

The proposed regulation for mercury (D009, K071, K106, and U151) wastewaters specifies a BDAT concentration of 0.030 mg/l mercury to qualify for land disposal as a hazardous waste. Olin takes exception to this proposal. These wastewaters are typically effluents from NPDES/POTW treatment facilities and are stored in surface impoundments prior to discharge. In multi-plant operations, these ponds are used as either emergency basins (to handle upsets in the treatment units) or for accumulation prior to discharge. Further, NPDES or POTW discharge limits are multi-variable and the ponds are used to "smooth-out" any variations in any of the discharge parameters. Olin believes that treated wastewaters below 0.200 mg/l should not be considered a hazardous waste, and hence use of discharge impoundments would continue to be regulated under NPDES/POTW wastewater permits. The Agency established the 0.030 mg/l mercury standard based on the assumption that the fully oxidized wastewater from K071 washing is the most complex to treat. Actually, the fully oxidized wastewater from K071 treatment is the easiest to treat by sulfide addition. Much more complex streams come from multi-product facilities - specifically the sodium hydrosulfite process. These streams contain soluble, non-ionic forms of mercury which cannot be treated to <30 ppb by simple sulfide addition. Olin submitted data on this to the Agency during the comment period of the first third regulations.

COMMENT NUMBER: 10-C-2
DOCKET NUMBER: LD-12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAt Standard at Level Below Characteristic Level
RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP). This commenter also submitted very similar comments on this issue for the Second Thirds Rule (Docket No. LD-10-00051)

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA

COMMENT NUMBER: 10-C-2 (continued)
DOCKET NUMBER: LD-12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAt Standard at Level Below Characteristic Level
RESPONSE:

has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-3
Docket Number: LD12-00132
Commenter: The Chlorine Institute
Issue: Mercury-Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

The Institute further believes the proposed high and low total mercury subcategories of D009 waste be eliminated. The sole criteria for BDAT treatment requirement should be an extractable 0.2 mg/l or greater mercury in leachate as defined by the EP toxicity or TCLP tests. Also the Institute asserts that it is improper to establish BDAT standards for characteristic wastes at concentrations below the level (0.2 mg/l) utilized to define a characteristic waste. Therefore the Institute opposes the proposed 0.030 mg/l mercury BDAT standard for D009 wastewaters. Similarly the Institute opposes the less than 0.025 mg/l mercury leachate criteria for D009 nonwastewaters.

COMMENT NUMBER: 10-C-3

DOCKET NUMBER: LD12-00132

COMMENTER: THE CHLORINE INSTITUTE

ISSUE: Mercury Characteristic Waste (D009)

SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP). This commenter also submitted very similar comments on this issue for the Second Thirds Rule (Docket No. LD-10-00054).

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA

COMMENT NUMBER: 10-C-3 (continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-4
Docket Number: LD12-00133
Commenter: PPG
Issue: Mercury-Characteristic Wastes (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

BDAT for all forms of D009 should be set at the current EP Toxicity level of 0.2 mg/l. The 1984 Hazardous and Solid Waste Amendments did not provide EPA with authority to regulate nonhazardous wastes.

COMMENT NUMBER:	10-C-4
DOCKET NUMBER:	LD12-00133
COMMENTER:	PPG
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP).

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a

COMMENT NUMBER: 10-C-4 (continued)
DOCKET NUMBER: LD12-00133
COMMENTER: PPG
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-5
Docket Number: L012-00251
Commenter: BF Goodrich
Issue: Mercury-Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

Contends that it is improper to establish BDAT standards for characteristic wastes at concentration levels below the level (0.2 mg/l) utilized to define such a characteristic waste.

Supports the proposed 0.2 mg/l, not the proposed 0.030 mg/l mercury BDAT standard for D-009 wastewaters.

Does not support the proposed less than .025 mg/l mercury leachate criteria for low mercury D-009 wastewater.

B. F. Goodrich believes the proposed high and low total mercury subcategories of D-009 waste should be eliminated. The sole criterion for BDAT treatment requirement should be an extractable 0.2 mg/l or greater mercury in leachate as defined by the EP Toxicity or TCLP test.

COMMENT NUMBER:	10-C-5
DOCKET NUMBER:	LD12-00251
COMMENTER:	B.F. GOODRICH
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP).

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a

COMMENT NUMBER: 10-C-5 (continued)
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-6
Docket Number: LD12-00258
Commenter: Akzo Chemicals Inc.
Issue: Mercury - Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

Akzo supports establishing the D009 non-wastewater treatment standard at the current 0.200 mg/kg EP Toxicity level for mercury.

Akzo further supports establishing the D009 non-wastewater treatment standard at the existing 0.200 mg/kg EP Toxicity level for mercury. BDAT treatment standards should not be allowed to lower concentration levels below the concentration level which is currently being used to define a characteristic waste without substantial, scientifically conducted testing demonstrating the need for this change.

COMMENT NUMBER: 10-C-6
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach.

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate.

Comment Number: 10-C-7
Docket Number: LD12-00265
Commenter: Pioneer
Issue: Mercury-Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level
Comment: Below the Characteristic Level

Pioneer further believes the proposed high and low total mercury subcategories of D009 waste should be eliminated. The sole criteria for BDAT treatment requirements should be an extractable 0.2 mg/l or greater mercury in leachate as defined by the EP toxicity or TCLP tests. Also Pioneer asserts that it is improper to establish BDAT standards for characteristic wastes at concentrations below the level (0.2 mg/l) utilized to define a characteristic waste. Therefore Pioneer opposes the proposed 0.030 mg/l mercury BDAT standard for D009 wastewaters. Similarly Pioneer opposes the less than 0.025 mg/l mercury leachate criteria for D009 non-wastewaters.

COMMENT NUMBER: 10-C-7
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level
RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP).

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a

COMMENT NUMBER:	10-C-7 (continued)
DOCKET NUMBER:	LD12-00265
COMMENTER:	PIONEER
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Establishment of BDAT Standard at Level Below Characteristic Level
RESPONSE:	

strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-8
Docket Number: LD12-00143
Commenter: General Motors
Issue: Mercury - Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

Proposed Treatment Standards for Mercury

The Agency has proposed two options for the treatment standard for mercury D009 wastewaters (page 48441). GM recommends that the second option be adopted, i.e., establishing the treatment standard at the existing characteristic level of 0.2 mg/l as measured in the leachate generated in the EP Toxicity test. We further recommend that the same standard be established for all mercury D009 nonwastewaters.

COMMENT NUMBER: 10-C-8
DOCKET NUMBER: LD12-00143
COMMENTER: GENERAL MOTORS CORP.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level
RESPONSE:

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter, as well as other commenters, also stated that the proposed high and low mercury subcategories for D009 nonwastewaters be eliminated and that the sole criteria for BDAT should be an extractable 0.2 mg/l or greater mercury in the leachate (EP or TCLP).

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate. EPA has decided to promulgate BDAT as roasting/retorting for high-mercury subcategory nonwastewaters because EPA believes that mercury can be recovered from these wastes and that there is a

COMMENT NUMBER: 10-C-8 (continued)

DOCKET NUMBER: LD12-00143

COMMENTER: GENERAL MOTORS CORP.

ISSUE: Mercury Characteristic Waste (D009)

SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

RESPONSE:

strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible. This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery.

Comment Number: 10-C-9
Docket Number: L012-00186
Commenter: LCP Chemicals
Issue: Mercury-Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at Level Below the Characteristic Level
Comment:

No associated residual numerical "performance" standard should be established for retorted D009 wastes.

COMMENT NUMBER: 10-C-9
DOCKET NUMBER: LD12-00186
COMMENTER: LCP CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-,ercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach.

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate.

Comment Number: 10-C-10
Docket Number: L012-00138
Commenter: OXYCHEM
Issue: Mercury-Characteristic Waste (D009)
Subissue: Establishment of BDAT Standard at
Comment: Level Below the Characteristic Level

BDAT for D009 non-wastewaters should be changed from 0.025 mg/l to 0.2 mg/l (as measured by the TCLP) to reflect the level at which a solid waste is characterized as hazardous.

The Proposed Limit for D009 Wastewaters, Which Is Based on K071 Wastewater, Is Unachievable. This Is Documented by the Office of Water Treatability Data That Are Used To Develop the Alternative Multi-Source Leachate Standards.

The K071 wastewater data were used to propose a treatment standard of 0.030 mg/l, expressed as a grab sample concentration (54 Fed. Reg. 48441). The technology used at the single facility tested by EPA was sulfide precipitation.

Certain of the Office of Water data that are used to develop the alternate treatment standard for mercury in wastewaters are based on long-term performance data from treatment systems that are identical to the K071 system, but which represent a wider range of wastewater characteristics. For example, the effluent limitations guidelines for chlor-alkali plants are based on the application of sulfide precipitation technology, plus filtration (40 C.F.R. 415,66). The achievable concentration for mercury, expressed as a maximum 24-hour composite, is 0.11 mg/l. The difference between the proposed standard and the basis for the effluent guidelines standard is due to the difference in the completeness of the data bases. The effluent guidelines data are typically much more complete and comprehensive than the data from the BDAT studies; thus, they are more representative of true long-term treatment performance and process variability. The effluent guidelines data are the only acceptable data base for establishing any concentration-based standards for mercury in D009 wastewaters.

If the Agency establishes a treatment standard for D009 wastewaters that is different from the characteristic level, it should be based on the alternative wastewater standards of the proposal (54 Fed. Reg. 48461).

COMMENT NUMBER: 10-C-10
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter also stated that if the Agency establishes any wastewater standard that is different from the characteristic level, then the standard should be based on the alternative wastewater standards of the proposed rule.

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate.

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Comment Number: 10-C-11
Docket Number: LD12-L0007
Commenter: CMA
Issue: Mercury - Characteristic Waste (D009)
Subissue: ESTABLISHMENT OF BDAT STANDARD AT LEVEL BELOW THE CHARACTERISTIC LEVEL
Comment:

V. The Proposed Limit for D009 Wastewater Is Unachievable. This Is Documented by the Office Of Water's Treatability Data That Are Used To Develop the Alternate Multi-source Leachate Standards.

EPA relies on K071 wastewater data to propose a treatment standard of 0.030 mg/l (expressed as a grab sample concentration for D009 wastewater). 54 Fed. Reg. at 48,441/2. The technology used at the single facility tested by EPA was sulfide precipitation.

The Office of Water data used to develop the alternate treatment standard for mercury in wastewaters are based on long-term performance data from treatment systems that are identical to the K071 system, but which represent a wider range of wastewater characteristics (Table 4-126, Background Document for wastewaters containing BDAT list constituents (LD12-S1061)). For example, the effluent limitations guidelines for chlor-alkali plants are based on the application of sulfide precipitation technology, plus filtration (40 C.F.R. § 415.66). The achievable concentration for mercury, expressed as a maximum 24-hour composite, is 0.11 mg/l.

Comment Number: 10-C-11
Docket Number: LD12-L0007
Commenter: CMA
Issue: Mercury - Characteristic Waste (D009)
Subissue: ESTABLISHMENT OF BDAT STANDARD AT LEVEL BELOW THE CHARACTERISTIC LEVEL
Comment:

The difference between the proposed standard and the basis for the effluent guidelines standard is due to the difference in the completeness of the databases. The effluent guidelines data are typically much more complete and comprehensive than the data from the BDAT studies; thus, they are more representative of true long-term treatment performance and process variability. Therefore, the effluent guidelines data are more appropriate for establishing concentration-based standards for mercury in D009 wastewaters.

CMA recommends that the Agency establish a treatment standard for D009 wastewaters at the characteristic level. In any event, the treatment standard should be no lower than the

0.150 mg/l based on the alternate wastewater standards in section III.A.7. of the proposal. 54 Fed. Reg. at 48,461.

COMMENT NUMBER: 10-C-11
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Establishment of BDAT Standard at Level Below Characteristic Level

In the proposed rule, EPA proposed two regulatory options. The first option was to set a treatment level at the characteristic level. The second option was to transfer performance treatment data for K071 and require a mercury level of 0.025 mg/l for low-mercury subcategory treated D009 nonwastewaters and a mercury level of 0.030 mg/l for all treated D009 wastewaters. This commenter, as well as other commenters, opposed the establishment of BDAT standards below the level that defines the hazardous characteristic level and described problems associated with this proposed approach. This commenter also stated that if the Agency establishes any wastewater standard that is different from the characteristic level, then the standard should be based on the alternative wastewater standards of the proposed rule.

The Agency has carefully reviewed these comments and has decided not to set treatment standards below the characteristic level in this rulemaking even though the data available to EPA indicate that lower proposed standards are achievable. However, EPA maintains that it has the authority to set lower levels when the data demonstrate that such levels are achievable and minimize threats to human health and the environment. For this rulemaking, EPA has chosen to regulate D009 wastewaters at the characteristic level of 0.2 mg/l and D009 low-mercury subcategory nonwastewaters at the characteristic level of 0.2 mg/l in the TCLP leachate.

Comment Number: 10-D-1
Docket Number: L012-00067
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste - D009
Subissue: Stabilization on Sulfide Precipitated D009 as BDAT
Comment:

A series of investigations were conducted into the feasibility of commercial stabilization techniques for a variety of metal containing waste regulated under the proposed Third Third regulation published in the November 22, 1989 Federal Register (54 FR 48372). HWTC reported the first phase of results from these investigation to EPA on December 26, 1989.

Additional data has been generated as a result of these ongoing investigations which HWTC is submitting for review in this package. This additional data primarily addresses recent issues raised by EPA concerning the affect of high pH on the mobility of stabilized metallic constituents and the demonstration must be made that a significant reduction of mobility occurs over the unstabilized waste.

Both submissions present data which indicate a wider range of stabilization TCLP results than is appropriate for regulation (i.e. the high values should not necessarily be averaged with the lower values as a basis for BDAT). The reagents can be adjusted for the stabilization of any given waste to achieve the lowest concentration in the TCLP extract. The data presented reflects a number of different recipes. Care should be exercised in determining the "best" results for any given constituent.

II. Mercury

Section VIII of the 12/26/89 submission provided data demonstrating that mercury can be effectively stabilized using commercially available stabilization. Attachment A of this report presents the additional data.

Loads 6257, 6264 & 3734A are composed of mercury contaminated soil and debris from the natural gas pipeline industry. The additional data on this waste includes the following:

a. TCLP analysis of unstabilized waste (Hg = 0.16 and 0.17 mg/l.

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Comment Number: 10-D-1

Docket Number: LD12-00067

Commenter: Hazardous Waste Treatment Council

Issue: Mercury-Characteristic Waste (D009)

Subissue: Stabilization on Sulfide Precipitated D009 as BDAT

Comment:

b. TCLP adjusted to 10.5 pH for unstabilized waste (Hg = 0.3 and 0.062 mg/l),

c. TCLP for stabilized waste (Hg = 0.045, 0.031 and 0.0002 mg/l),

d. TCLP adjusted to 10.5 pH for stabilized waste (Hg = 0.074, 0.033 and 0.0004 mg/l).

HWTC believes the data support the contention that commercial stabilization significantly reduces the mobility of mercury. Further the alteration of the pH in the extractor vessel does not significantly alter the mobility of the mercury after stabilization.

VII. SUMMARY

HWTC has presented the results of a investigation into the suitability of commercial stabilization for a variety of metallic constituents proposed for regulation under the Third-Third proposed regulation. The data contained in this document and the data submitted by HWTC on 12/26/89 support the following conclusions:

a. Wastes containing arsenic, selenium, thallium, barium, mercury, nickel, lead, chromium, can be stabilized using currently available technology.

b. Significant reduction in the mobility of these metallic ions occurs as a result of properly-conducted, commercially-available stabilization.

c. Adjustment of the pH of the TCLP extractor to simulate an alkaline post-BDAT landfill does not significantly increase mobility of these metallic ions. In fact, the alkaline-adjusted, TCLP results demonstrate significant reductions in metallic-ion mobility thereby confirming the original wisdom of EPA in the selection of an acid medium for the TCLP.

h. A numerical mercury nonwastewater BDAT standard based upon stabilization should be promulgated as soon as possible. The proposed metals recovery BDAT should be dropped along with the two-year deadline extension.

Comment Number: 10-D-1
Docket Number: LD12-00067
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Stabilization on Sulfide Precipitated D009 as BDAT
Comment:

Hazardous Waste Treatment Council
Third Third Data Submission (supplemental)
December 29, 1989
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b. TCLP adjusted to 10.5 pH for unstabilized waste (Hg = 0.3 and 0.062 mg/l),

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b. Significant reduction in the mobility of these metallic ions occurs as a result of properly-conducted, commercially-available stabilization.

c. Adjustment of the pH of the TCLP extractor to simulate an alkaline post-BDAT landfill does not significantly increase mobility of these metallic ions. In fact, the alkaline-adjusted, TCLP results demonstrate significant reductions in metallic-ion mobility thereby confirming the original wisdom of EPA in the selection of an acid medium for the TCLP.

h. A numerical mercury nonwastewater BDAT standard based upon stabilization should be promulgated as soon as possible. The proposed metals recovery BDAT should be dropped along with the two-year deadline extension.

Comment Number: 10-D-1
Docket Number: LD12-00067
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Stabilization or Sulfide Precipitated D009 as BDAT
Comment:

ATTACHMENT A

SUPPLEMENTAL DATA CONCERNING MERCURY

TCLP Number 12-19-89-D12 Load Number 6257
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	0.112	
2	Barium	2.38	
3	Cadmium	0.025	
4	Chromium	360	
5	Lead	0.066	
6	Mercury	0.16	
7	Nickel	2.7	
8	Selenium	1.42	
9	Silver	0.014	
10	Thallium	0.423	

ommments PRETREATMENT - D CODE STUDY - REGULAR TCLP

aste	Comp 1 Mass	Component 1
ass	Comp 2 Mass	Component 2
	Comp 3 Mass	Component 3
	Comp 4 Mass	Component 4

inal Volume Initial Volume Volume Increase 0

CLP Number 12-19-89-D13 Load Number 6264A
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic	0.112	
2	Barium	1.7	
3	Cadmium	0.014	
4	Chromium	0.052	
5	Lead	0.066	
6	Mercury	0.17	
7	Nickel	1.24	
8	Selenium	0.927	
9	Silver	0.014	
0	Thallium	0.07	

mments PRETREATMENT - D CODE STUDY - REGULAR TCLP

ste	Comp 1 Mass	Component 1
ss	Comp 2 Mass	Component 2
	Comp 3 Mass	Component 3
	Comp 4 Mass	Component 4

nal Volume Initial Volume Volume Increase 0

Comment Number: 10-D-1

Docket Number: LD12-00067

Commenter: Hazardous Waste Treatment Council

Issue: Mercury – Characteristic Waste (D009)

Subissue: Stabilization on Sulfide Precipitated D009 as BDAT

Comment:

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:CLP Number 12-19-89-D18              Load Number 6257
[redacted]          Waste Code 1 D009  2          3          4
 #      Metal                         Total                 Stabilized
 1      Arsenic                       0.356
 2      Barium                        2.86
 3      Cadmium                       0.015
 4      Chromium                      2.83
 5      Lead                          0.268
 6      Mercury                       0.3
 7      Nickel                        2.37
 8      Selenium                      0.154
 9      Silver                        0.014
10      Thallium                      0.07

:omments  PRETREATMENT - D CODE STUDY - TCLP PH ADJUSTED TO 10.5

asta                Comp 1 Mass          Component 1
ass                 Comp 2 Mass          Component 2
                    Comp 3 Mass          Component 3
                    Comp 4 Mass          Component 4

:nal Volume                Initial Volume                Volume Increase  0
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CLP Number 12-19-89-D19               Load Number 6264
[redacted]          Waste Code 1 DC09  2          3          4
 #      Metal                         Total                 Stabilized
 1      Arsenic                       0.599
 2      Barium                        1.79
 3      Cadmium                       0.009
 4      Chromium                      1.59
 5      Lead                          0.066
 6      Mercury                       0.062
 7      Nickel                        1.82
 8      Selenium                      0.154
 9      Silver                        0.014
:0      Thallium                      0.07

:mments  PRETREATMENT - D CODE STUDY - TCLP PH ADJUSTED TO 10.5

ısta                Comp 1 Mass          Component 1
ıss                 Comp 2 Mass          Component 2
                    Comp 3 Mass          Component 3
                    Comp 4 Mass          Component 4

.nal Volume                Initial Volume                Volume Increase  0
```

5

Comment Number: 10-D-1
Docket Number: LD12-00067.
Commenter: Hazardous Waste Treatment Council
Issue: Mercury - Characteristic Waste (D009)
Subissue: Stabilization on Sulfide Precipitated D009 as BDAT
Comment:

TCLP Number 12-20-89-D06 Load Number 6264
GM # [redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic		0.293
2	Barium		0.907
3	Cadmium		0.009
4	Chromium		0.844
5	Lead		0.222
6	Mercury		0.031
7	Nickel		0.393
8	Selenium		0.221
9	Silver		0.014
10	Thallium		0.222

Comments PRETREATMENT - D CODE STUDY - REGULAR TCLP

Waste Mass 100	Comp 1 Mass 100	Component 1 [redacted]
	Comp 2 Mass 1	Component 2 [redacted]
	Comp 3 Mass 160	Component 3 [redacted]
	Comp 4 Mass 40	Component 4 [redacted]

inal Volume 220 Initial Volume 100 Volume Increase 2.2

CLP Number 12-20-89-D12 Load Number 6257
[redacted] Waste Code 1 D009 2 3 4

#	Metal	Total	Stabilized
1	Arsenic		0.204
2	Barium		0.883
3	Cadmium		0.009
4	Chromium		0.079
5	Lead		0.132
6	Mercury		0.074
7	Nickel		0.184
8	Selenium		0.154
9	Silver		0.014
10	Thallium		0.07

omments PRETREATMENT - D CODE STUDY - TCLP PH ADJUSTED TO 10.5

aste ass 100	Comp 1 Mass 100	Component 1 [redacted]
	Comp 2 Mass 1	Component 2 [redacted]
	Comp 3 Mass 140	Component 3 [redacted]
	Comp 4 Mass 35	Component 4 [redacted]

nal Volume 220 Initial Volume 100 Volume Increase 2.2

Comment Number: 10-D-1

Docket Number: L012-00067

Commenter: Hazardous Waste Treatment Council

Issue: Mercury - Characteristic Waste - D009

Subissue: Stabilization on Sulfide Precipitated D009 as BDAT

Comment:

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TCLP Number 12-20-89-D05          Load Number 3734A
[redacted]        Waste Code 1 D002  2 D007  3        4
 #      Metal                   Total                   Stabilized
 1      Arsenic                                         0.112
 2      Barium                                          0.76
 3      Cadmium                                         0.009
 4      Chromium                                        0.138
 5      Lead                                            0.103
 6      Mercury                                         0.0002
 7      Nickel                                          0.037
 8      Selenium                                        0.154
 9      Silver                                          0.019
10      Thallium                                        0.166

omments   PRETREATMENT - D CODE STUDY - REGULAR TCLP

aste             Comp 1 Mass 1         Component 1  [redacted]
ass    100       Comp 2 Mass 160       Component 2  [redacted]
                 Comp 3 Mass 40        Component 3  [redacted]
                 Comp 4 Mass           Component 4

inal Volume     220      Initial Volume     100      Volume Increase  2.2

CLP Number 12-20-89-D06           Load Number 6264
[redacted]        Waste Code 1 D009  2        3        4
 #      Metal                   Total                   Stabilized
 1      Arsenic                                         0.293
 2      Barium                                          0.907
 3      Cadmium                                         0.009
 4      Chromium                                        0.844
 5      Lead                                            0.222
 6      Mercury                                         0.031
 7      Nickel                                          0.393
 8      Selenium                                        0.221
 9      Silver                                          0.014
10      Thallium                                        0.222

mments   PRETREATMENT - D CODE STUDY - REGULAR TCLP

ste              Comp 1 Mass 100       Component 1  [redacted]
ss     100       Comp 2 Mass 1         Component 2  [redacted]
                 Comp 3 Mass 160       Component 3  [redacted]
                 Comp 4 Mass 40        Component 4  [redacted]

nal Volume      220      Initial Volume     100      Volume Increase  2.2
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Comment Number: 10-0-1

Docket Number: LD12-00067

Commenter: Hazardous Waste Treatment Council

Issue: Mercury - Characteristic Waste (D009)

Subissue: Stabilization on Sulfide precipiated D009 as BDAT

Comment:

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TCLP Number 12-20-89-D04                    Load Number 6257
[redacted]          Waste Code 1 D009  2          3        4
  #      Metal                          Total              Stabilized
  1      Arsenic                                           0.261
  2      Barium                                            1.14
  3      Cadmium                                           0.009
  4      Chromium                                          0.052
  5      Lead                                              0.136
  6      Mercury                                           0.045
  7      Nickel                                            0.037
  8      Selenium                                          0.168
  9      Silver                                            0.014
 10      Thallium                                          0.243

Comments  PRETREATMENT - D CODE STUDY - REGUALR TCLP

Waste              Comp 1 Mass 100      Component 1  [redacted]
Mass    100        Comp 2 Mass 1        Component 2  [redacted]
                   Comp 3 Mass 140      Component 3  [redacted]
                   Comp 4 Mass 35       Component 4  [redacted]

inal Volume        220      Initial Volume     100     Volume Increase  2.2

TCLP Number 12-20-89-D05                    Load Number 3734A
[redacted]          Waste Code 1 D002  2 D007  3       4
  #      Metal                          Total              Stabilized
  1      Arsenic                                           0.112
  2      Barium                                            0.76
  3      Cadmium                                           0.009
  4      Chromium                                          0.138
  5      Lead                                              0.103
  6      Mercury                                           0.0002
  7      Nickel                                            0.037
  8      Selenium                                          0.154
  9      Silver                                            0.019
 10      Thallium                                          0.166

omments  PRETREATMENT - D CODE STUDY - REGULAR TCLP

aste               Comp 1 Mass 1        Component 1  [redacted]
ass    100         Comp 2 Mass 160      Component 2  [redacted]
                   Comp 3 Mass 40       Component 3  [redacted]
                   Comp 4 Mass          Component 4

inal Volume        220      Initial Volume     100     Volume Increase  2.2
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COMMENT NUMBER: 10-D-1
DOCKET NUMBER: LD12-00067
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

This commenter, as well as other commenters, believes that the proposed thermal recovery standard is not needed for mercury-containing wastes in the proposed high-mercury subcategory because the mercury in the wastes can be immobilized using commercially available stabilization.

The commenter provided the results of treatment studies on the effectiveness of commercially available stabilization techniques for treating D009 soil and debris contaminated with mercury from the gas pipeline industry. The results consist of:

- Total mercury content of 4 untreated wastes
- TCLP analyses for 2 of the 4 untreated wastes
- TCLP analyses for all 4 of the treated wastes. Duplicate analyses were performed for 3 of the treated wastes and triplicate analyses for one of the treated wastes
- TCLP analyses under alkaline conditions (pH = 10.5) for two treated and untreated wastes

The data from this submission were not used to calculate a standard because the total mercury content of the untreated wastes, ranging from 24 to 89 mg/kg, places these wastes in the low-mercury subcategory for which the BDAT standard is 0.2 mg/l as measured by TCLP. The TCLP results of the untreated wastes (0.16 and 0.17 mg/l) show that these untreated wastes do not meet the criterion for the D009 low-mercury subcategory (i.e., 0.2 mg/l as measured

COMMENT NUMBER: 10-D-1 (Continued)
DOCKET NUMBER: LD12-00067
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

by TCLP). Thus, these data do not represent treatment of mercury wastes subject to BDAT. However, if a standard were calculated from these data it would have been 0.17 mg/l.

EPA has evaluated the various comments carefully but has determined that treatment standards for those mercury wastes amenable to recovery (i.e., high-mercury subcategory wastes) should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for high-mercury subcategory wastes as explained in the Background Document and in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a) (6)).

In the proposed rule (54 FR 48440), EPA requested comments on whether it should establish requirements under 40 CFR Parts 264 and 265 for mercury sulfide wastes and for mercury residues in general. The proposed requirements were the result of a concern that leaching of mercury from these wastes may increase if the wastes were placed under alkaline conditions.

This commenter, as well as other commenters addressed this issue. The majority believe that, although regulations requiring

COMMENT NUMBER: 10-D-1 (Continued)

DOCKET NUMBER: LD12-00067

COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL

ISSUE: Mercury Characteristic Waste (D009)

SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

segregation of wastes or use of monofills could be implemented, specific regulations are not needed at this time for several reasons: a) operators of landfills must now monitor leachate collection systems for the migration of metals; b) operators of landfills already segregate these wastes as part of the waste analysis plan; c) such requirements should be made on a site- and waste-specific basis by the permit writers at the state and federal level; and d) some vendors of specialized stabilization materials have submitted information that show some promise in stabilizing these materials under alkaline conditions.

At this time , EPA is withdrawing its proposed requirements under 40 CFR Parts 264 and 265. The Agency feels that additional data are needed before a determination can be made to issue such a national prohibition standard. Still, EPA believes that permit writers can determine the need for requiring additional prohibitions upon disposal of these wastes on a case-by-case basis according to the provisions under 40 CFR Parts 264 and 265.

Comment Number: 10-D-2
Docket Number: L012-00073
Commenter: Chemfix
Issue: Mercury - Characteristic Waste (D009)
Subissue: Stabilization on Sulfide Precipitated D009 as BDAT
Comment:

MERCURY

The agency discusses the problems of alkaline disposal conditions for mercury sulfide wastes and for mercury residues in an alkaline environment in general. The following comments are directed at the potential for the CHEMSET™/ CHEMFIX® Process to render mercury sulfide as well as mercuric oxide wastes to within the proposed 30 ppBillion TCLP standard.

The attached Database for all of the "D" metals indicates that the straight CHEMFIX® Process as applied directly to mercuric wastes, is not as successful in reducing mercury leachability to very low levels, as it is with other heavy metals and analytes of concern. However, through a CHEMSET™ proprietary pretreatment followed by the basic CHEMFIX® Process, mercury wastes can be rendered stable under the alkaline conditions of the CHEMFIX® end product matrix. And, the final product will meet the TCLP standards of 30 ppBillion or below. The full range of the capabilities of this CHEMSET™/CHEMFIX® mercury fixation process are not known. But, it is clear that the option of stabilization/fixation (S/F) treatment should not be foreclosed as a viable BDAT treatment. S/F should be allowed if any given generator can show that their particular waste can be rendered to within the TCLP standards established.

Comment Number: 10-D-2
Docket Number: L012-00073
Commenter: Chemfix
Issue: Mercury – Characteristic Waste (D009)
Subissue: Stabilization on Sulfide Precipitated D009 as BDAT
Comment:

"CALIFORNIA LIST" METALS DATABASE SUMMARY

CONSTITUENTS OF CONCERN	NUMBER OF SAMPLES	TOTAL CONC. (AVERAGE) mg/kg	STATUTORY LEVELS + mg/l	HEALTH BASED STANDARDS mg/l (HBS)	LEACHATE CONCENTRATIONS IN EP EXTRACTS OF CHEMFIX PRODUCT / COMPARED TO HEALTH BASED STANDARD (HBS)		
					LESS THAN 1X HBS*	LESS THAN 10X HBS	LESS THAN 100X HBS**
ARSENIC	229	<0.01 - 2000 (Avg.= 34.47)	500	0.05	101 (44%)	217 (95%)	227 (99%)
CADMIUM	243	0.01 - 98000 (Avg.= 643.9)	100	0.01	13 (5%)	208 (86%)	232 (95%)
CHROMIUM	253	0.03 - 709970 (Avg.= 4035.1)	500	0.05	62 (25%)	231 (91%)	247 (98%)
LEAD	258	0.1 - 96200 (Avg.= 1879.6)	500	0.05	6 (2%)	213 (83%)	253 (98%)
MERCURY	188	0.005 - 37200 (Avg.= 43.70)	20	0.002	34 (18%)	105 (56%)	183 (97%)
NICKEL	234	0.05 - 37320 (Avg.= 588.4)	134	0.34	169 (72%)	229 (98%)	234 (100%)
SELENIUM	201	<0.01 - 80.0 (Avg.= 6.89)	100	0.01	40 (20%)	143 (71%)	199 (99%)
THALLIUM	N.A.	N.A.	130	0.01	N.A.	N.A.	N.A.

N.A. : Sample not anlayzed for constituent.

+ : Statutory levels are based on the "California Metal Lists" published on the HSWA 1984.

* : 1 time health based standard equivalent to drinking water standard.

** : 100 times health based standard equivalent to EP toxicity standard.

Comment Number: 10-D-2
Docket Number: L012-00073
Commenter: Chemfix
Issue: Mercury - Characteristic Waste (D009)
Subissue: Stabilization n Sulfide Precipitated D009 as BDAT
Comment:

CHEMFIX TECHNOLOGIES, INC.
TECHNICAL SERVICES REPORT

CHEMFIX END PRODUCT EP DATA from Commercial Facility Waste

EPA HAZARDOUS WASTE NUMBER	CHARACTERISTIC CONTAMINANT	RAW MATERIAL (mg/kg)	CHEMFIX PRODUCT (mg/l)	REGULAT LIMIT (mg/l
D004	Arsenic	<0.002	0.003	5.0
D005	Barium	<0.10	<0.10	100.0
D006	Cadmium	0.501	<0.005	1.0
D007	Chromium	17.9	0.12	5.0
D008	Lead	87.0	<0.10	5.0
D009	Mercury	0.0220	<0.0004	0.2
D010	Selenium	0.006	0.027	1.0
D011	Silver	0.01	0.010	5.0
D012	Endrin	<0.20	<0.002	0.02
D013	Lindane	<0.10	<0.001	0.4
D014	Methoxychlor	<1.0	<0.010	10.0
D015	Toxaphene	<2.0	<0.020	0.5
D016	2,4-D	1.080	<0.120	10.0
D017	2,4,5-TP (Silvex)	<0.085	<0.017	1.0

PHYSICAL CHARACTERISTICS

	pH (S.U.)	Density (g/ml)	Total Solids (%)
Raw Waste	12.2	1.01	3.8

POCKET PENETROMETER READINGS (tons per square foot)

	24 Hours	48 Hours
CHEMFIX PRODUCT	3.25	4.0

COMMENT NUMBER: 10-D-2
DOCKET NUMBER: LD12-00073
COMMENTER: CHEMFIX
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAt or Sulfide Precipitated D009 as BDAT

This commenter believes that stabilization should be allowed as a BDAT option. The commenter provided information (summary information only) on the results of commercial proprietary stabilization of D009 wastes. The commentor stated that their treatment method had been used on 188 D009 waste samples ranging in untreated total mercury content from 0.005 to 37,200 mg/kg (average of 43.7 mg/kg). EP leachates of the treated wastes were reported to be less than the characteristic level for 98 percent of the samples. Because individual sample data, QA/QC data, and untreated waste extraction data were not provided it was not possible to assess the performance of the data submitted. The Agency has requested supplemental data from the commenter. However, at the time of this rulemaking, no response to the request has been received. The commenter did provide individual EP data for one treated sample, <0.0004 mg/l, that had a total mercury content in the untreated waste of 22 mg/kg. However, this data point was not used to calculate a standard because no untreated waste leachate test date were provided. However, if a standard had been calculated using this data point, it would have been 0.001 mg/l.

EPA has evaluated the various comments submitted relating to this issue and has determined that treatment standards for those mercury wastes amenable to recovery (i.e., high-mercury subcategory wastes) should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for high-mercury subcategory wastes as explained in the Background Document and in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for

COMMENT NUMBER: 10-D-2 (Continued)
DOCKET NUMBER: LD12-00073
COMMENTER: CHEMFIX
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAt or Sulfide Precipitated D009 as BDAT

treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a) (6)).

In the proposed rule (54 FR 48440), EPA requested comments on whether it should establish requirements under 40 CFR Parts 264 and 265 for mercury sulfide wastes and for mercury residues in general. The proposed requirements were the result of a concern that leaching of mercury from these wastes may increase if the wastes were placed under alkaline conditions.

This commenter, as well as other commenters addressed this issue. The majority believe that, although regulations requiring segregation of wastes or use of monofills could be implemented, specific regulations are not needed at this time for several reasons: a) operators of landfills must now monitor leachate collection systems for the migration of metals; b) operators of landfills already segregate these wastes as part of the waste analysis plan; c) such requirements should be made on a site- and waste-specific basis by the permit writers at the state and federal level; and d) some vendors of specialized stabilization materials have submitted information that show some promise in stabilizing these materials under alkaline conditions.

At this time , EPA is withdrawing its proposed requirements under 40 CFR Parts 264 and 265. The Agency feels that additional

COMMENT NUMBER: 10-D-2 (Continued)
DOCKET NUMBER: LD12-00073
COMMENTER: CHEMFIX
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAt or Sulfide Precipitated D009 as BDAT

data are needed before a determination can be made to issue such a national prohibition standard. Still, EPA believes that permit writers can determine the need for requiring additional prohibitions upon disposal of these wastes on a case-by-case basis according to the provisions under 40 CFR Parts 264 and 265.

Comment Number: 10-D-3
Docket Number: LD12-00133
Commenter: PPG
Issue: Mercury - Characteristic Waste (D009)
Subissue: Stabilization or Sulfide Precipi~~tated~~ D009 as BDAT
Comment:

Sulfide precipitated K106 and D009 should be defined as BDAT as generated. Based upon EPA's concerns that leachability would be increased by mixing with alkaline wastes, the BDAT standard should prescribe that disposal of these wastes be in a monofill environment.

COMMENT NUMBER: 10-D-3
DOCKET NUMBER: LD12-00133
COMMENTER: PPG
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

This commenter, as well as other commenters, believes that the proposed thermal recovery standard is not needed for D009 wastes that are generated as mercury sulfides. A primary basis for this belief is that because these wastes contain mercury in the form of mercury sulfide, a relatively insoluble and immobile form of mercury under most conditions, disposal of these wastes is environmentally sound and should be deemed BDAT.

EPA has evaluated these comments carefully but has determined that treatment standards for those mercury wastes amenable to recovery should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for K106 wastes as explained in the Background Document, as well as in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a) (6)).

A secondary basis for the commenter's belief is the concern that thermal treatment may result in increased emissions of mercury to air. Responses to these comments are addressed in Subissue D responses to comments.

In the proposed rule (54 FR 48440), EPA requested comments on whether it should establish requirements under 40 CFR Parts 264 and 265 for mercury sulfide wastes and for mercury residues in general.

COMMENT NUMBER: 10-D-3 (continued)
DOCKET NUMBER: LD12-00133
COMMENTER: PPG
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

The proposed requirements were the result of a concern that leaching of mercury from these wastes may increase if the wastes were placed under alkaline conditions.

This commenter, as well as other commenters addressed this issue. The majority believe that, although regulations requiring segregation of wastes or use of monofills could be implemented, specific regulations are not needed at this time for several reasons: a) operators of landfills must now monitor leachate collection systems for the migration of metals; b) operators of landfills already segregate these wastes as part of the waste analysis plan; c) such requirements should be made on a site- and waste-specific basis by the permit writers at the state and federal level; and d) some vendors of specialized stabilization materials have submitted information that show some promise in stabilizing these materials under alkaline conditions.

At this time , EPA is withdrawing its proposed requirements under 40 CFR Parts 264 and 265 for wastes containing mercury. The Agency feels that additional data are needed before a determination can be made as to the need for a national prohibition standard.

Comment Number: 10-D-4
Docket Number: LD12-00138
Commenter: OXYCHEM
Issue: Mercury – Characteristic Waste (D009)
Subissue: Stabilization or Sulfide Precipitated D009 as BDAT
Comment:

Mercury sulfide is a stable, relatively immobile compound under most conditions, including typical groundwater pH. Thermal treatment to decompose this compound into more mobile compounds and transferring mercury from the solid waste to air, waster and solid waste (as demonstrated in The Chlorine Institute's December 21, 1989 submission) is questionable environmental protection. The following treatment is recommended: stabilization to a level of 0.2 mg/l mercury as measured by the TCLP (or alkaline) leachate procedure.

1COMMENT NUMBER: 10-D-4
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

This commenter, as well as other commenters, believes that the proposed thermal recovery standard is not needed for D009 wastes that are generated as mercury sulfides. A primary basis for this belief is that because these wastes contain mercury in the form of mercury sulfide, a relatively insoluble and immobile form of mercury under most conditions, disposal of these wastes is environmentally sound and should be deemed BDAT.

EPA has evaluated these comments carefully but has determined that treatment standards for those mercury wastes amenable to recovery should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for K106 wastes as explained in the Background Document, as well as in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a) (6)).

A secondary basis for the commenter's belief is the concern that thermal treatment may result in increased emissions of mercury to air. Responses to these comments are addressed in Subissue D responses to comments.

In the proposed rule (54 FR 48440), EPA requested comments on whether it should establish requirements under 40 CFR Parts 264 and 265 for mercury sulfide wastes and for mercury residues in general.

COMMENT NUMBER: 10-D-4 (continued)
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

The proposed requirements were the result of a concern that leaching of mercury from these wastes may increase if the wastes were placed under alkaline conditions.

This commenter, as well as other commenters addressed this issue. The majority believe that, although regulations requiring segregation of wastes or use of monofills could be implemented, specific regulations are not needed at this time for several reasons: a) operators of landfills must now monitor leachate collection systems for the migration of metals; b) operators of landfills already segregate these wastes as part of the waste analysis plan; c) such requirements should be made on a site- and waste-specific basis by the permit writers at the state and federal level; and d) some vendors of specialized stabilization materials have submitted information that show some promise in stabilizing these materials under alkaline conditions.

At this time , EPA is withdrawing its proposed requirements under 40 CFR Parts 264 and 265 for wastes containing mercury. The Agency feels that additional data are needed before a determination can be made as to the need for a national prohibition standard.

Comment Number: 10-D-5
Docket Number: LD12-00172
Commenter: Hazardous Waste Treatment Council
Issue: Mercury - Characteristic Waste (D009)
Subissue: Stabilization of Sulfide Precipitated D009 as BDAT
Comment:

Several of our member companies utilize treatment technology that is applicable to wastes described above that are not amenable to retorting. The only mercury wastes that cannot be treated are elemental mercury and mercury oxides. The chemical treatment involves oxidation of the mercurous ions to the mercuric state, followed by precipitation as the sulfide. This is a form that is of extremely low solubility in water as well as in strong acids and bases. Therefore, with this treatment, water soluble inorganic mercury is readily treated to less than EP toxic levels. The waste can then be stabilized.

EPA should allow treatment and stabilization of mercury bearing waste, and should consider establishing treatability subgroups for low mercury levels and recovery for high mercury levels as was done for lead in K061 and mercury in K071 waste. Stabilization is appropriate for low level mercury waste containing mercury salts (See data submittal made by HWTC).

COMMENT NUMBER: 10-D-5
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated D009 as BDAT

This commenter states that EPA should allow stabilization as a BDAT option. The commenter further states that stabilization is appropriate for low level mercury waste containing mercury salts.

EPA has evaluated the various comments submitted relating to this issue and has determined that treatment standards for those mercury wastes amenable to recovery (i.e., high-mercury subcategory wastes) should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for high-mercury subcategory wastes (i.e., contain 260 mg/kg or greater mercury) as explained in the Background Document and in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a) (6)). For wastes in the low-mercury subcategory (i.e., contain less than 260 mg/kg of mercury), BDAT has been promulgated as 0.2 mg/l as measured by TCLP).

Comment Number: 10-D-6
Docket Number: LD12-L0034
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Stabilization or Sulfide Precipitated D009 as BDAT
Comment:

The HWTC supports these comments and urges EPA to set BDAT on the basis of stabilization. Comments were provided to the LD12 docket by the HWTC providing one data set of a member company on mercury stabilization (Docket No. 00050 and 00067). This data supports that stabilization below the characteristic level is achievable for mercury, and the treatment standard based on this data would be set at 0.052 ppm (see table below).

MERCURY STABILIZATION DATA SUBMITTED BY HWTC

Data Point		TCLP (mg/l)	ln
1		0.04	-3.2189
2		0.167	-1.7898
3		0.03	-3.5066
4		0.04	-3.2189
5		0.0744	-2.5983
6		0.0546	-2.9077
7		0.04	-3.2188
	Mean	0.0375	
	VF	1.39	
	BDAT Standard	0.052	

Comment Number: 10-D-6
Docket Number: L012-L0034
Commenter: Hazardous Waste Treatment Council
Issue: Mercury-Characteristic Waste (D009)
Subissue: Stabilization a Sulfide Precipitated D009 as BDAT
Comment:

If EPA has insufficient data on mercury stabilization to set a numerical treatment standard, the HWTC recommends a technology specific BDAT standard of "stabilization as a mercury sulfide". The stability of mercury sulfide is well established, demonstrated and documented in numerous chemical and environmental technology publications. If EPA still feels the need to persist in setting BDAT on the basis of thermal recovery, then EPA should also set an alternate BDAT of "Stabilization to a mercury sulfide precipitate". This is because the extensive comments provided the docket critiquing thermal recovery make it clear that there are numerous D009, K106 waste forms that are not amenable to thermal recovery. A few of these commenters are summarized below:

Olin Chemical Corp.	Docket No. 00124
Pioneer Chlor Alkali Co.	Docket No. 00265
PPG Industries	Docket No. 00133
Vulcan Chemicals	Docket No. 00128

All of these commenters support a standard based on stabilization as opposed to retorting. To put it as Olin expressed it, the fate of all of the mercury stabilized as a mercury sulfide is accounted for, whereas the fate of the mercury in thermal recovery is unknown or literally up in the air! The PEI study could only account for 70% of the mercury, most of which was captured as a salt in various portions of the APCE residuals, and not recovered in elemental form. This also implies that EPA should not arbitrarily set a threshold requiring mercury recovery on the basis of how low in mercury content the residuals are. EPA must allow an option for industry to properly manage those mercury wastes that are not amenable to thermal recovery. Vulcan accurately points out in their comments that debris waste contaminated with mercury is not amenable to thermal recovery (see page 6).

COMMENT NUMBER: 10-D-6
DOCKET NUMBER: LD12-L0034
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated as BDAT

This commenter, as well as other commenters, believes that the proposed thermal recovery standard is not needed for mercury-containing wastes in the proposed high-mercury subcategory that are generated as mercury sulfides. The commenters emphasize that because these wastes contain mercury in the form of mercury sulfide, a relatively insoluble and and immobile form of mercury under most conditions, disposal of these wastes is environmentally sound and thus, EPA should deem these wastes to meet BDAT, as generated. Another issue raised by the commenter is that thermal recovery may result in increased emissions of mercury to air and also may result in recovery residuals that contain a more leachable form of mercury than the untreated waste.

EPA has evaluated the various comments carefully but has determined that treatment standards for those mercury wastes amenable to recovery (i.e., high-mercury subcategory wastes) should be based on recovery technologies. EPA has determined that thermal recovery is a demonstrated technology for high-mercury subcategory wastes (i.e., contain 260 mg/kg or greater mercury) as explained in the Background Document and in the response to comments for subissue 10-B. There is a strong preference in the land disposal restrictions for treatment standards to be based on recovery where possible (e.g., S. Rep. No. 284 at 17). This preference is reinforced by the overall goals of RCRA to encourage waste minimization and resource recovery (e.g., RCRA section 1003(a)(6)). For wastes in the low-mercury subcategory (i.e., contain less than 260 mg/kg of mercury), BDAT has been promulgated as 0.2 mg/l as measured by TCLP).

COMMENT NUMBER: 10-D-6 (continued)
DOCKET NUMBER: LD12-L0034
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Stabilization as BDAT or Sulfide Precipitated as BDAT

The Agency further concludes that compliance with the mercury NESHAP, PSD BACT/LAER controls, or installation of the control technologies on which the standards are based, will ensure that point source air emissions of mercury are contolled so as to be protective of human health and the environment.

EPA has also considered the argument that wastes from retorting will contain a more leachable form of mercury than at least the mercury sulfide wastes being retorted. Although this will be true in some cases, leachable mercury in retorting wastes will still be at low levels, and well below the characteristic level. More important, there will be less mercury to leach over time because most mercury will be recovered as product. Thus, overall potential of disposed mercury to be released to the environment will be significantly reduced. Retorting/roasting also achieves volumetric waste reduction compared to stabilization because it reduces the overall volume of waste to be disposed, unlike stabilization which increases it.

The commenter also refers to stabilization data provided in a previous submission to EPA. This data submission is addressed in response 10-D-1.

Comment Number: 10-E-1
Docket Number: LD12-00110
Commenter: CYANOKEM
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

We support EPA's selection of retorting as BDAT for many mercury wastes. but we are concerned that this technology is not applicable to every waste form represented by the full range covered by the D009 waste code. In particular, for solids and debris waste the mercury retorting technology is not appropriate. Other problems with mercury retorting are as follows:

- Highly acid or alkaline wastes can corrode retort equipment.
- Sludges above 45 or 50% moisture may not be compatible.
- Treatment of mercury vapors (elemented, oxides, etc.) must be addressed for scrubbing solutions used to remove mercury from off-gases produced during the refluxing process.

These issues are discussed more fully in the following reference:

- Metal and Inorganic Waste Reclaiming Encyclopedia, Marshall Sittig, Noyes Data Corporation, Park Ridge, N.J., 1980, pages 362-366.

CyanoKEM's treatment technology is applicable to wastes described above that are not amenable to retorting. The only mercury wastes that cannot be treated are elemental mercury and mercury oxides. The chemical treatment involves oxidation of the mercurous ions to the mercuric state, followed by precipitation as the sulfide. This is a form that is of extremely low solubility in water as well as in strong acids and bases. Therefore, with this treatment, water soluble inorganic mercury is readily treated to less than EP toxic levels.

CyanoKEM can provide data to EPA in the future, on waste streams not amenable to retorting. We are currently practicing the chemical treatment described above on a full scale basis, at our current capacity of approximately 1 million gallons/year, expandable to 5 million gallons/year.

COMMENT NUMBER:	10-E-1
DOCKET NUMBER:	LD12-00110
COMMENTER:	CYANOKEM
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated

COMMENT NUMBER: 10-E-1 (continued)
DOCKET NUMBER: LD12-00110
COMMENTER: CYANOKEN
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

This commenter referred EPA to the Metal and Inorganic Waste Reclaiming Encyclopedia for a discussion of potential problems associated with retorting of mercury wastes. EPA thanks the submitter for the reference. EPA reviewed the reference and agrees with the author and submitter that retorting of mercury wastes does present the potential problems identified by the commenter. EPA also agrees with the author that "In the treatment of mercury-containing waste materials, one widely used method is to heat the mercury-containing waste in a retort to recover the metallic mercury." EPA also agrees with the author that there are technologies for dealing with the identified problems.

Comment Number: 10-E-2
Docket Number: LD12-00128
Commenter: VULCAN CHEMICALS
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

Regarding the treatment of materials from the manufacturing use of mercury which may contain characteristic levels of mercury, thermal treatment is not applicable and has not been demonstrated as technically feasible. We would suggest that for these types of contaminated equipment, e.g. gloves, pipe, etc., that washing of the contaminated equipment with sodium hypochlorite solution, triple rinsing, followed by acidification and sulfide precipitation of the washing and rinsing solutions be considered as appropriate treatment technology, and not thermal processing or retorting.

COMMENT NUMBER: 10-E-2
DOCKET NUMBER: LD12-00128
COMMENTER: VULCAN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated

COMMENT NUMBER: 10-E-2 (continued)
DOCKET NUMBER: LD12-00128
COMMENTER: VULCAN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-3
Docket Number: LD12-00129
Commenter: OLIN CHEMICALS
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

Many of the D009 non-wastewaters generated by mercury cell chlorine plants are not suitable for retorting. D009 wastes have very diverse characteristics and vary widely in adaptability to treatment. The transfer of BDAT standards from relatively homogeneous mercury containing wastes, especially considering the scant database used in developing these standards, to heterogeneous D009 waste, is totally inappropriate.

Olin proposes that D009 wastes which are not suitable for retorting, such as pipe, concrete, steel, etc., be treated using existing decontamination procedures, as currently practiced by mercury cell chlorine plants. These decontamination procedures include washing with water, hypochlorite, or polysulfide solutions.

COMMENT NUMBER: 10-E-3
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA. (This commenter also submitted very similar comments on this same issue for the Second Thirds Rule (Docket No. LD-10-00051).

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

COMMENT NUMBER: 10-E-3 (continued)
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-4
Docket Number: LD12-00258
Commenter: AKZO CHEMICALS INC.
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

Many of the D009 non-wastewaters generated by mercury cell chlorine plants are not suitable for retorting. These D009 wastes have been previously identified by the Chlorine Institute's comments to the EPA regarding developing BDAT for D009 wastes dated February 27, 1989.

These D009 wastes which are not suitable for retorting should be treated using existing decontamination procedures which are currently practiced by mercury cell chlorine plants. These decontamination procedures include washing with water, hypochlorite, and polysulfide solutions.

Akzo maintains that many D009 materials are not treatable with incineration or retorting. Decontamination procedures should be developed for these wastes and only a EP Toxicity or TCLP concentration based treatment standard applied.

COMMENT NUMBER: 10-E-4
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-5
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

Certain categories of D009 mercury containing wastes from chlor alkali manufacturing are not viable candidates for retorting. BDAT for these categories should be specified decontamination procedures as practiced by the industry. Those categories not suitable for retorting include the following: wood, glassware, rubber, dirt, gloves, concrete, sandblast grit, rags, tanks and piping.

Retorting as BDAT for D009 wastes generated in chlor alkali manufacturing should be limited to the following categories: carbon, cell house trench and sump cleanings, and caustic filter solids. No associated residual numerical "performance" standard should be established for D009 waste.

Pioneer believes that many of the D009 non-wastewaters generated by mercury cell chlorine plants are not suitable for retorting. These D009 wastes have been previously identified by the Chlorine Institute's comments to the EPA regarding developing BDAT for D009 wastes dated February 27, 1989. D009 wastes have very diverse characteristics and vary widely in adaptability to treatment. The transfer of BDAT standards from relatively homogenous mercury containing wastes, especially considering the scant database used in developing these standards to heterogeneous D009 waste, is totally inappropriate.

Therefore, Pioneer proposes that D009 wastes which are not suitable for retorting should be treated using existing decontamination procedures which are currently practiced by mercury cell chlorine plants. These wastes include the following:

wood
glassware
rubber
dirt
gloves
concrete
sandblast
grit
rags
tanks
piping

At the same time, Pioneer believes that the following D009 wastes, derived from chlor-alkali operations, should be suitable for thermal treatment:

Spent activated carbon

Cell house trench and sump cleanings

Sump caustic filter cake

Pioneer proposes that the three specified D009 wastes be subject to a BDAT "treatment" standard of "roasting or retorting" with no associated residue numerical "performance" standard.

Pioneer believes land burial of many types of D009 should be considered acceptable BDAT after appropriate decontamination unless a different BDAT standard is identified for a specific D009 waste. These decontamination procedures include washing with water, hypochlorite, or polysulfide solutions. Attachment 1 details such a procedure.

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Comment Number: 10-E-5
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

DECONTAMINATION PROCEDURES FOR D009 WASTES

All vessels and piping that contain elemental mercury will be allowed to drain into a containment until mercury is no longer draining. The elemental mercury will be collected and returned to the mercury inventory.

After all mercury drainage has ceased, the interior of the vessel or pipe will be washed with either a hypochlorite solution or a polysulfide solution. It will then be triple rinsed with water. Other items such as gloves, rubber gaskets, rags, etc., will be similarly washed and rinsed. All washings shall be sent to the wastewater treatment facility for removal of mercury prior to discharge through NPDES Outfalls.

Remaining solids are to be drained of all free liquids, drummed and sent to a permitted hazardous waste landfill.

COMMENT NUMBER: 10-E-5
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/ retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-6

Docket Number: LD12-00186

Commenter: LCP Chemicals

Issue: Mercury Characteristic Waste (D009)

Subissue: Alternative Treatment for "Debris" and Other Wastes

Comment:

Certain categories of D009 mercury containing wastes from chlor alkali manufacturing are not viable candidates for retorting. BDAT for these categories should be specified decontamination procedures as practiced by the industry. Those categories not suitable for retorting include the following: wood, glassware, rubber, dirt, gloves, concrete sandblast grit, rags, tanks and piping.

Retorting as BDAT for D009 wastes generated in chlor alkali manufacturing should be limited to the following categories: carbon, cell house trench and sump cleaning, caustic filter solids.

COMMENT NUMBER:	10-E-6
DOCKET NUMBER:	LD12-00186
COMMENTER:	LCP CHEMICALS
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/ retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-7

Docket Number: LD12-00172

Commenter: HAZARDOUS WASTE TREATMENT COUNCIL

Issue: MERCURY CHARACTERISTIC WASTE (D009)

Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES

Comment:

We support EPA's selection of retorting as BDAT for many mercury wastes. but we are concerned that this technology is not applicable to every waste form represented by the full range covered by the D009 waste code. In particular, for solids and debris waste the mercury retorting technology is not appropriate. Other problems with mercury retorting are as follows:

- Highly acid or alkaline wastes can corrode retort equipment.
- Sludges above 45 or 50% moisture may not be compatible.
- Treatment of mercury vapors (elemented, oxides, etc.) must be addressed for scrubbing solutions used to remove mercury from off-gases produced during the refluxing process.

These issues are discussed more fully in the following reference:

- Metal and Inorganic Waste Reclaiming Encyclopedia, Marshall Sittig, Noyes Data Corporation, Park Ridge, N.J., 1980, pages 362-366.

COMMENT NUMBER: 10-E-7
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated

COMMENT NUMBER: 10-E-7 (continued)
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

This commenter referred EPA to the Metal and Inorganic Waste Reclaiming Encyclopedia for a discussion of potential problems associated with retorting of mercury wastes. EPA thanks the submitter for this reference. EPA has reviewed this reference and agrees with the author and the commenter that retorting of mercury of mercury wastes does present the potential problems identified by the commenter. EPA also agrees with the author that "In the treatment of mercury-containing materials, one widely used method is to heat the mercury-containing waste in a retort to recover the metallic mercury." EPA also agrees with the author that there are technologies for dealing with the identified problems.

Comment Number: 10-E-8
Docket Number: LD12-L0034
Commenter: HAZARDOUS WASTE TREATMENT COUNCIL
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

The EPA sent the HWTC an extensive data package from the Chlorine Institute (Docket No. 00025), regarding performance evaluations of thermal recovery technologies for mercury performed by PEI associates. We concur with the conclusions of that report, that many D009 wastes are not amenable to thermal recovery. The report raises serious environmental concerns as the mercury is shown to be dispersed in the environment, with no recovery of mercury demonstrated, for thermal recovery technology.

COMMENT NUMBER: 10-E-8
DOCKET NUMBER: LD12-L0034
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/ retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-9
Docket Number: LD12-00138
Commenter: OXYCHEM
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

. In addition, there are a number of D009 wastes that are not conducive to thermal treatment:

- Equipment (such as tanks, pumps and piping), concrete, wood and scrap metal, have physical characteristics that would require a significant amount of cutting and/or grinding to enable the waste to be fed to a thermal treatment unit. The Background Document did not address this concern. The cutting of these wastes has the potential to cause a localized mercury emission, and be detrimental to the environment.
- Rubber, plastic, soils and debris are materials whose combustion products and residues would be of concern. While these materials would typically contain low concentrations of mercury, the proposed 16 mg/kg cut-off, coupled with the difficulty in obtaining a representative sample, may cause the need to thermally treat.

Should these wastes require thermal treatment, another concern is the difficulty in designing both the feed system and the optimum capacity for a thermal treatment unit. It is unlikely the EPA can show that a multipurpose feed system is "demonstrated", given the fact that even large commercial incinerators are restricted by their feed systems.

It is recommended that wastes that are not conducive to thermal treatment be decontaminated using a procedure similar to existing RCRA decontamination requirements.

COMMENT NUMBER: 10-E-9
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-E-10
Docket Number: LD12-00251
Commenter: BF GOODRICH
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

Certain categories of D-009 mercury containing wastes from chlor-alkali manufacturing are not viable candidates for retorting. BDAT for these categories should be specified decontamination procedures as practiced by the industry. Those categories not suitable for retorting include the following: wood, glassware, rubber, dirt, gloves, concrete, sandblast grit, rags, tanks and piping.

Retorting as BDAT for D-009 wastes generated in chlor-alkali manufacturing should be limited to the following categories: carbon, cell house trench and sump cleanings, caustic filter solids.

D-009 non-wastewater wastes that are treatable, i.e., carbon, cell house trench and sump cleanings, and caustic filter solids, should be subject to a BDAT "treatment" standard of roasting or retorting with no associated residual numerical "performance" standard.

Believes that many of the D-009 non-wastewater generated by mercury cell chlorine plants are not suitable for retorting. These wastes have very diverse characteristics and vary widely in adaptability to treatment. The transfer of BDAT from relatively homogenous mercury containing waste to heterogenous D-009 waste is totally inappropriate.

The D-009 waste not suitable for retorting should be treated using existing decontamination procedures. The waste includes the following: wood, dirt, sandblasting debris, tanks, glassware, piping, gloves, rubber, concrete, rags and grit.

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Comment Number: 10-E-10
Docket Number: LD12-00251
Commenter: BF GOODRICH
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

The D-009 wastes derived from chlor-alkali operation anticipated to be suitable for thermal treatment are: spent activated carbon, cell house trench and sump cleanings and spent filter cake. These three specified D-009 wastes should be subject to a BDAT treatment standard of roasting or retorting with no associated residue numerical performance standard.

B. F. Goodrich believes land burial of D-009 as generated be considered satisfactory after appropriate decontamination unless a BDAT standard is identified for a specific D-009 waste.

COMMENT NUMBER: 10-E-10
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA.

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

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Comment Number: 10-E-11
Docket Number: L012-00132
Commenter: The Chlorine Institute
Issue: Mercury - Characteristic Waste (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

C. D009 Comments

The Institute believes that many of the D009 nonwastewaters generated by mercury cell chlorine plants are not suitable for retorting. These D009 wastes have been previously identified by the Chlorine Institute's comments to the EPA regarding developing BDAT for D009 wastes dated February 27, 1989 (Attachment 1). D009 wastes have very diverse characteristics and vary widely in adaptability to treatment. The transfer of BDAT standards from relatively homogenous mercury containing wastes, especially considering the scant database used in developing these standards to heterogeneous D009 waste, is totally inappropriate.

Therefore the Chlorine Institute proposes that D009 wastes which are not suitable for retorting should be treated using existing decontamination procedures which are currently practiced by mercury cell chlorine plants. These wastes include the following:

wood
dirt
sandblast
tanks
glassware
gloves
grit
piping
rubber
concrete
rags

At the same time, the Institute believes that the following D009 wastes, derived from chlor-alkali operations, should be suitable for thermal treatment:

- Spent activated carbon
- Cell house trench and sump cleanings
- Spent caustic filter cake

The Institute proposes that the three specified D009 wastes be subject to a BDAT "treatment" standard of "roasting or retorting" with no associated residue numerical "performance" standard.

The Institute believes land burial of D009 as generated be considered satisfactory after appropriate decontamination unless a specific BDAT standard is identified for a specific D009 waste. These decontamination procedures include washing with water, hypochlorite, or polysulfide solutions. Attachment 2 details such a procedure.

Comment Number: 10-E-11
Docket Number: LD12-00132
Commenter: The Chlorine Institute
Issue: Mercury-Characteristic Waste (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

The Institute is supplying the agency with information concerning the quantities and types of D009 wastes and encourages the agency to categorize D009 wastes when developing BDAT Standards in order to address the variability of materials represented.

Comments

I. Types and quantities of D009 wastes generated by mercury cell chlor-alkali producers.

A survey of generation of D009 wastes was conducted among Institute members. The results of that survey are given in Table I. Total generation is only about 4,000 tons per year. Estimations indicate that only 10 to 50 percent of the D009 wastes are possibly treatable materials; the balance are miscellaneous items possibly contaminated with mercury including wood, fiberglass, rubber, dirt, gloves, concrete, old piping, tanks, etc., that are automatically declared by industry as D009 waste because of the virtual impossibility of the collection of representative samples for analysis of the mercury content.

II. Large percentage of D009 wastes are not treatable.

The Chlorine Institute wishes to emphasize to the agency that D009, as a characteristic waste, takes many forms. Table II shows the D009 wastes divided into nontreatable and possibly treatable categories.

Wastes such as concrete slabs or chunks, soils from excavations during construction, discarded piping, and tanks are not treatable by any of the technologies under consideration by USEPA. The materials are also low in mercury content. Since these types of materials are difficult to subject to an EP Toxicity Test, it is the general practice of member companies to conservatively classify them as D009 based on the possibility of mercury contamination.

The Institute considers that this is an environmentally sound classification approach to these materials and affirms that these materials must be land-filled due to their inherent nature.

III. Retorting of D009 Wastes.

Historically, some Institute members have used high temperature metals recycling (retorting) to recover mercury from very small quantities of D009 wastes. The leachability of mercury in the ash from the units is unknown.

IV. Technology transfer from K071 treatment.

The acid leaching/chemical oxidation/filtration washing and simple water washing and filtration technologies in use on K071 non-wastewaters are not appropriate for generic transfer to D009 wastes. The K071 technology treats a homogeneous, readily filterable solid material containing primarily a water soluble mercury compound, mercuric chloride. Most D009 wastes generated in the chlorine industry are not homogeneous and the mercury is present as elemental mercury.

Comment Number: 10-E-11
Docket Number: LD12-00132
Commenter: The Chlorine Institute
Issue: Mercury- Characteristic Waste (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

EPA RCRA Docket (0S-305)
Reference: Docket Number F-89-LD10-FFFFP
D009 Wastes
Page 3

V. Amalgamation with zinc, and/or denuding of mercury amalgams to regenerate mercury and zinc.

The Institute requests that EPA provide information concerning the demonstration and availability of such a technology. The Institute members have no information concerning this method of treating D009 type materials.

Recovery of mercury from some types of D009 waste is conceptually feasible. However, there are technical problems due to the variability in the kinds of D009 wastes and with mercury vapor emissions control. The total volume of D009 wastes from chlor-alkali manufacturers possibly treatable by retorting is 300 to 1,000 tons per year.

In order to assist EPA in understanding the various types of D009 wastes being generated, several of the member companies of the Chlorine Institute have volunteered to EPA or an EPA contractor(s) to visit one or more of the mercury cell chlor-alkali plants. If EPA is interested in arranging such a visit, please contact the Chlorine institute, and we will provide a list of these companies and the contact person.

TABLE II
D009 WASTES

Possibly Treatable	Non Treatable
Carbon	Wood
Cell House Trench and Sump Cleanings	Glassware
Caustic Filter Solids	Rubber
	Dirt
	Gloves
	Concrete
	Sandblast Grit
	Rags
	Tanks
	Piping

Comment Number: 10-E-11
Docket Number: L012-00132
Commenter: The Chlorine Institute
Issue: Mercury - Characteristic Waste (D009)
Subissue: ALTERNATIVE TREATMENT FOR "DEBRIS" AND OTHER WASTES
Comment:

ATTACHMENT 2

DECONTAMINATION PROCEDURES FOR D009 WASTES

All vessels and piping that contain elemental mercury will be allowed to drain into a containment until mercury is no longer draining. The elemental mercury will be collected and returned to the mercury inventory.

After all mercury drainage has ceased, the interior of the vessel or pipe will be washed with either a hypochlorite solution or a polysulfide solution. It will then be triple rinsed with water. Other items such as gloves, rubber gaskets, rags, etc., will be similarly washed and rinsed. All washings shall be sent to the wastewater treatment facility for removal of mercury prior to discharge through NPDES Outfalls.

Remaining solids are to be drained of all free liquids, drummed and sent to a permitted hazardous waste landfill.

COMMENT NUMBER:	10-E-11
DOCKET NUMBER:	LD12-00132
COMMENTER:	THE CHLORINE INSTITUTE
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Alternative Treatment for "Debris" and Other Wastes

This commenter, as well as others, have identified some D009 nonwastewaters which they believe meet EPA's criteria for contaminated soil and debris. The commenters state that these wastes are not readily amenable to roasting/retorting. Also, several the commenters have requested that EPA consider setting alternative treatment standards based on the use of chemical decontamination procedures. The commenters believe that these alternative treatment technologies result in treated wastes (referred to by some commenters as decontaminated materials) allowable for disposal under Section 3004(m) of HSWA. (This commenter also submitted very similar comments on this same issue for the Second Thirds Rule (Docket No. LD-10-00054).

Although EPA recognizes that there is variability in D009 wastes, EPA has been unable to determine whether these D009 wastes deserve the creation of a seperate treatability group and whether the alternative chemical decontamination technologies represent BDAT for these wastes. EPA believes that the commenters have not provided sufficient information to enable EPA to assess the performance of alternative technologies they recommend. Also, EPA believes that pretreatment followed by thermal recovery may be generally applicable and can be used to treat at least some of these wastes for mercury recovery. For example by analogy, one commenter provided information indicating that their facility routinely recovers chromium from debris such as waste refractory bricks containing chromium.

COMMENT NUMBER: 10-E-11 (continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Alternative Treatment for "Debris" and Other Wastes

Therefore, EPA is reaffirming its proposed rule establishing retorting/roasting as BDAT for high mercury subcategory D009 nonwastewaters. If these wastes meet the criteria of contaminated soil and debris, the Agency may be publishing revisions to this standard as it continues the general effort to develop seperate standards for soil and debris wastes. Because of the two-year national capacity variance granted for such debris in this rule, the issue need not be defined immediately.

Comment Number: 10-F-1
Docket Number: LD12-00040
Commenter: OXYCHEM
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

At this time, OxyChem is submitting new data on thermal desorption of mercury from wastes at its Muscle Shoals facility in Sheffield, Alabama. EPA's proposed BDAT Background Document for Mercury Wastes identified pilot plant data submitted by this facility as one of three data sets reviewed by the EPA.

In addition to the K106 data, the facility generated twelve data points from the retorting of cell room trench sludge (D009). This data is shown below:

Date	Total Mercury	Date	Total Mercury
20-Sep-88	1350	29-Sep-89	2042
29-Nov-88	2015	29-Sep-89	32
02-Feb-89	378	24-Oct-89	332
24-Apr-89	796	24-Oct-89	160
14-Jun-89	345	31-Oct-89	260
08-Aug-89	515	31-Oct-89	170

No data was generated on the sample prior to retorting, nor was any EP toxicity data generated.

This data does not support the proposed 16 mg/kg level at which wastes would require thermal treatment. Should thermal treatment be identified at BDAT in final rulemaking, it is requested that this data be included in EPA's determination of "high/low" mercury levels.

COMMENT NUMBER: 10-F-1
DOCKET NUMBER: LD12-00040
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed

COMMENT NUMBER: 10-F-1 (Continued)
DOCKET NUMBER: LD12-00040
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

and operated thermal recovery processes will allow routine recovery of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-2
Docket Number: LD12-00258
Commenter: AKZO CHEMICALS INC.
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

The proposed regulations included a 16 mg/kg total mercury cutoff limit for retorting K071, K106 and D009 non-wastewaters. The proposed total mercury retorting cutoff limit is based on data from the 1974 retorting of a mixture of K071 and K106 (Perry, 1974). This data is not supported by QA/QC (analytical recoveries). The EPA assumes that this data was adjusted for accuracy of the analytical method used.

Using the McDermott Mine (cinnubar ores) data provides a 31.5 ppm average mercury concentration of the treated material. Applying EPA's variability factor of 5.1 to this average mercury concentration, results in a treatment standard of 160 mg/kg. The McDermott Mine data is adjusted for accuracy of the analytical method and therefore represents a data source which is more consistent with BDAT methodology.

Retorting mercury wastes at the higher mercury concentrations provides a much greater opportunity for achieving actual mercury recovery. Since recovery of the hazardous constituent is an important consideration in developing BDAT, retorting mercury wastes with higher mercury concentrations is also consistent with BDAT methodology.

Akzo supports a retorting cutoff limit in the 160 mg/kg range which is supported by QA/QC data and provides greater opportunity for actual mercury recovery.

COMMENT NUMBER: 10-F-2
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-2 (Continued)
DOCKET NUMBER: LD12-00258
COMMENTER: AKZO CHEMICALS INC.
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-3
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

The proposed regulations include a 16 mg/kg cutoff limit for retorting K071, K106 and D009 non-wastewaters. Pioneer believes that this concentration limit is inappropriate for the following reasons:

The proposed regulations include a 16 mg/kg total mercury cutoff limit for retorting K071, K106 and D009 non-wastewaters. In establishing this level, the EPA cites concentrations of mercury found in the residue of thermally treated material. However, apparently not taken into account was the environmental tradeoff from retorting waste at or near this concentration where little or no recovery will be achieved. Accordingly, to environmentally justify retorting, the cutoff level should be established at a mercury concentration in the untreated material high enough to provide a greater opportunity to achieve both actual recovery and a significant decrease of mercury in the waste. The establishment of a higher mercury cutoff is also consistent with EPA's own BDAT methodology that was established which indicated that recovery of the hazardous constituent is an important consideration in developing BDAT. Thus, the Institute recommends that this cutoff level be set at no less than 160 mg/kg.

The Agency has identified the McDermitt Mine Technology as BDAT for mercury containing wastes. However, the high/low mercury waste cutoff is based not on the study of the designated BDAT technology, but on a previous study Mercury Recovery From Contaminated Waste Water and Sludges, EPA Document - 6601, 2-74-086, December, 1974, (Perry Study) Although the Perry Study is titled "Mercury Recovery . . . " there is no data reporting that any mercury was recovered from the system. The data only reports mercury level reduction in the residual ash. The system used in the Perry Study was not successful in recovering any mercury and was proven not to be commercially viable and was subsequently abandoned. In addition, the data in the Perry Study is not supported by any QA/QC data. Use of the McDermitt Mine (cinnabar ores) data provides a 31.5 ppm average mercury concentration of the treated material. Applying EPA's variability factor of 5.1 to this average mercury concentration results in a treatment standard of 160 ppm.

Retorting mercury wastes with higher mercury concentrations provides a much greater opportunity for achieving actual mercury recovery and a decrease for mercury in the waste. Since recovery of the hazardous constituent is an important consideration in developing BDAT, retorting mercury wastes with higher mercury concentrations is also consistent with BDAT methodology.

Pioneer thus supports a higher retorting cutoff limit of 160 mg/kg which is supported by QA/QC data and which proves greater opportunity for elemental mercury recovery.

COMMENT NUMBER: 10-F-3
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-3 (Continued)
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-4
Docket Number: LD12-00186
Commenter: LCP CHEMICALS
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

The minimum mercury concentration in untreated waste subject to retorting should be set at a high enough level that allows for actual recovery. The Institute has recommended that this level be no less than 160 mg/Kg as is supported by the November 1989 Background Document For Mercury Waste.

COMMENT NUMBER: 10-F-4
DOCKET NUMBER: LD12-00186
COMMENTER: LCP CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-4 (Continued)
DOCKET NUMBER: LD12-00186
COMMENTER: LCP CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-5
Docket Number: LD12-00138
Commenter: OXYCHEM
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

The Agency Has Proposed Recovery as a Treatment Standard for D009. K071 and K106 Wastes Containing Greater Than 16 mg/kg of Mercury. This Is Based on the Concentration of Mercury in the Residue From Thermal Recovery. The Concentration in the Residue From a Thermal Recovery Process Is Not a Basis For Determining the Lowest Concentration in the Untreated Waste at Which Recovery Will Be Practical.

The Agency has proposed a standard for D009, K071 and K106 nonwastewaters that requires thermal recovery for wastes containing higher than 16 mg/kg of mercury (54 Fed. Reg. 48400). This concentration was measured in the residue from the recovery of mercury from K071 and K106 wastes, in a study that was conducted 16 years ago. The unit which was used for the study has not operated for several years. In addition, EPA states in its Background Document that no QC/QA information was provided with this test data.

The value of 16 mg/kg was derived from a measurement of mercury in the residue from the treatment of a K071/K106 combined waste. Retort data was submitted to the Agency in previous comments, and in a meeting held between The Chlorine Institute and the EPA on December 21, 1989.

The Agency also cites cinnabar (mercury ore) as containing 100 mg/kg mercury after roasting, and not leaching mercury above the EP toxicity levels.

Neither of these concentrations are satisfactory technical bases for establishing the lower level of practicality for thermal recovery of mercury from D009, K071 and K106 nonwastewaters. EPA seems to have confused residue levels with concentrations in the untreated wastes. In the proposed standards for D008 nonwastewaters, the Agency at least was able to distinguish between recoverable concentrations in the untreated waste and the concentrations that remain in the residuals from the recovery process. Residue concentrations of a metal cannot serve as the basis for demonstrating untreated waste concentrations that are conducive to recovery. In fact, OxyChem believes that the Agency's proposed cutoff level for mercury recovery from D009 wastes is a ~~violation of~~ the BDAT methodology that EPA has established.

By basing the proposed cutoff for recoverable wastes on the residue, the Agency has not demonstrated the effectiveness of recovery, and ~~therefore~~ has not shown recovery to be a demonstrated technology for wastes containing low concentrations of mercury.

If the Agency promulgates a rule for D009, K071 and K106 wastes based on a treatment methodology rather than the characteristic level, it should develop the cutoff concentration for the application of recovery to mercury-containing wastes on the concentrations of mercury in the untreated wastes that are subjected to thermal recovery.

COMMENT NUMBER: 10-F-5
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-5 (Continued)
DOCKET NUMBER: LD12-00138
COMMENTER: OXYCHEM
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-6
Docket Number: LD12-L0007
Commenter: CMA
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

U. The Agency Has Erroneously Proposed Recovery as a Treatment Standard for D009 Wastes Based on the Concentration of Mercury in the Residue From Thermal Recovery Rather Than the Lowest Concentration in the Untreated Waste at Which Recovery Will Be Practical.

The Agency has proposed a standard for D009 nonwastewaters that requires thermal recovery for wastes containing greater than 16 mg/kg of mercury. 54 Fed. Reg. at 48,400. This concentration was measured in the residue from the recovery of mercury from K071 and K106 wastes. The Agency also cites concentrations in the residue from the roasting of cinnabar (mercury ore) as being 100 mg/kg, and not leaching mercury above the EP toxicity levels.

CMA believes that the Agency's proposed cutoff level for mercury recovery from D009 wastes is a violation of the BDAT methodology that EPA has established. On page 13 of the Methodology for Developing Best Demonstrated Available (BDAT) Treatment Standards (Docket No. LD10-S0012), the Agency states that:

> it is important to establish both the effectiveness of recovery (measure (sic) by changes in total concentration) and the stability of any treated residuals that may be sent to land disposal (TCLP test of the residuals).

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Comment Number: 10-F-6
Docket Number: L012-L0007
Commenter: CMA
Issue: Mercury - Characteristic Waste (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

Neither of these concentrations are satisfactory technical bases for establishing the lower level of practicality for thermal recovery of mercury from D009 nonwastewaters. EPA seems to have confused residue levels with concentrations in the untreated wastes. In the proposed standards for D008 nonwastewaters, the Agency at least was able to distinguish between the recoverable concentrations in the untreated waste and the concentrations that remain in the residuals from the recovery process.[1] Residue concentrations of a metal cannot serve as the basis for demonstrating untreated waste concentrations that are conducive to recovery.

By basing the proposed cutoff for recoverable wastes on the residue concentrations, the Agency has not demonstrated the effectiveness of recovery, and therefore has not shown recovery to be a demonstrated technology for wastes containing low concentrations of mercury.

If the Agency promulgates a rule for D009 wastes based on a treatment methodology rather than the characteristic level, it should develop the cutoff concentration for the application of recovery to mercury-containing wastes on the concentrations of mercury in the untreated wastes that are subjected to thermal recovery.

COMMENT NUMBER: 10-F-6
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-6 (Continued)
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-7
Docket Number: LD12-00251
Commenter: BF GOODRICH
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

The minimum mercury concentration of untreated waste subject to retorting should be set at a high enough level to allow for actual recovery. Recommend this level be no less than 160 mg/kg, as is supported by BDAT (McDermitt Mine).

The proposed regulations include a 16 mg/kg total mercury cutoff limit for retorting K-071, K-106 and D-009 non-wastewaters. In establishing this level, the EPA cites concentrations of mercury found in the residue of thermally treated material. However, apparently not taken into account was the environmental tradeoff from retorting waste at or near this concentration, where little or no recovery will be achieved. Accordingly, to justify retorting environmentally, the cutoff level should be established at a mercury concentration in the untreated material high enough to provide a greater opportunity to achieve both actual recovery and a significant decrease of mercury in the waste. The establishment of a higher mercury cutoff is also consistent with EPA's own BDAT methodology that was established which indicated that recovery of the hazardous constituent is an important consideration in developing BDAT. Thus, B. F. Goodrich recommends that this cutoff level be set at no less than 160 mg/kg.

In addition, the proposed standard based on residual concentration in treated material was based not on the McDermitt operations, but on a system using 95% K-071 and only 5% K-106 as a feed stock.(Mercury Recovery From Contaminated

Comment Number: 10-F-7
Docket Number: LD12-00251
Commenter: BF GOODRICH
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

Wastes and Sludges, EPA document 66012-74-086, Dec. 1974). This is significantly different from a 100% K-106 feed. Also, the system was proven not to be commercially operable, and no mercury was recovered. The system was subsequently abandoned. Nor was the study supported by QA/QC data. Using the McDermitt Mine (cinnabar ores) data provides a 31.5 mg/kg average mercury concentration of the treated material. Applying EPA's variability factor of 5.1 to this average mercury concentration results in a treatment standard of 160 mg/kg reflected in the proposed rules. The figures used in this calculation are supported by QA/QC data.

COMMENT NUMBER: 10-F-7
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-7 (Continued)
DOCKET NUMBER: LD12-00251
COMMENTER: B.F. GOODRICH
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-F-8
Docket Number: LD12-00132
Commenter: THE CHLORINE INSTITUTE
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: RECONSIDERATION OF THE RETORT CUTOFF LEVEL
Comment:

> The minimum mercury concentration in untreated waste subject to retorting should be set at a high enough level that allows for actual recovery. The Institute believes this level should be no less than 160 mg/kg as is supported by the Background Document (On site Engineering Report for McDermitt Mine).

The proposed regulations include a 16 mg/kg total mercury cutoff limit for retorting K071, K106 and D009 nonwastewaters. In establishing this level, the EPA cites concentrations of mercury found in the residue of thermally treated material. However, apparently not taken into account was the environmental tradeoff from retorting waste at or near this concentration, where little or no recovery will be achieved. Accordingly, to environmentally justify retorting, the cutoff level should be established at a mercury concentration in the untreated material high enough to provide a greater opportunity to achieve both actual recovery and a significant decrease of mercury in the waste. The establishment of a higher mercury cutoff is also consistent with EPA's own BDAT methodology that was established which indicated that recovery of the hazardous constituent is an important consideration in developing BDAT. Thus, the Institute recommends that this cutoff level be set at no less than 160 mg/kg.

In addition, the proposed standard based on residual concentration in treated material was based not on the McDermitt operations, but on a system using 95% K071 and only 5% K106 as a feed stock (Mercury Recovery From Contaminated Wastes and Sludges. EPA Document 66012-74-086. Dec. 1974). This is significantly different from a 100% K106 feed. Also, the system on which the standard is based was not successful in recovering any mercury and was proven not to be operationally viable, and was subsequently abandoned. Finally, this study is not supported by QA/QC data. Using the McDermitt Mine (cinnabar ores) data provides a 31.5 mg/kg average mercury concentration of the treated material. Applying EPA's variability factor of 5.1 to this average mercury concentration results in a treatment standard of 160 mg/kg reflected in the proposed rules. The figures used in this calculation are supported by QA/QC data.

COMMENT NUMBER: 10-F-8
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

In the proposed rule (54 FR 48440), EPA proposed a cutoff level of 16 mg/kg of total mercury to delineate two subcategories of mercury content, high and low, with high mercury wastes being required to meet a BDAT standard based of retorting or roasting. The 16 mg/kg cutoff level was calculated from two sets of retorting/roasting data collected by EPA. One data set is based on the results of retorting/roasting of mercury chloride/mercury sulfide wastes (mixture of K071 and K106) and the other data set is based on the thermal processing of cinnabar ores which the Agency considers as transferrable to the retorting/roasting of mercury sulfide sludges (i.e., K106 nonwastewaters). EPA relied on the mercury concentration data in the treated residuals from the retorting/roasting to derive the proposed cutoff.

This commenter, as well as others, have submitted comments and data urging EPA to reconsider the proposed cutoff level for several reasons. EPA finds the comments on this point persuasive. Based on these comments, therefore, EPA is revising the cutoff level from the proposed 16 mg/kg to 260 mg/kg. The new cutoff level is based on the lowest untreated waste mercury concentration for which retorting has been demonstrated (255 mg/kg rounded to 260 mg/kg).

EPA stresses that this new cutoff level should not be viewed as a relaxation of the standard or treatability group. Instead, the new cutoff level takes into account consistency in identifying treatability groups and the variability inherent to mercury sulfide wastes. The new cutoff level still recognizes that well-designed and operated thermal recovery processes will allow routine recovery

COMMENT NUMBER: 10-F-8 (Continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Reconsideration of the Retort Cutoff Level

of mercury from wastes with high mercury concentrations (i.e., 260 mg/kg or greater).

Comment Number: 10-G-1
Docket Number: L012-00198
Commenter: Department of Energy
Issue: Mercury - Characteristic Waste (D009)
Subissue: Treatment Standard for Mixed Waste
Comment:

11) 54 FR 48442, Standards for Radioactive Wastes Containing Mercury.[1]

EPA has proposed a treatment standard for elemental mercury wastes contaminated with radioactive materials of "Amalgamation with Zinc as a Method of Treatment." DOE requests that amalgamation with gold be included as a method of treatment. This alternate method is necessary due to process requirements for tritium production. The amalgamation with gold provides a similar decrease in air emissions, decrease in mobility and potential reduction in leachability of the liquid mercury to zinc amalgamation.

COMMENT NUMBER: 10-G-1
DOCKET NUMBER: LD12-00198
COMMENTER: U.S. DEPARTMENT OF ENERGY
ISSUE: Mercury Characteistic Waste (D009)
SUBISSUE: Treatment Standard for Mixed Waste
RESPONSE:

The commenter has requested that amalgamation with gold be included as an alternate method of treatment. However, the commenter provided no information or data to support the claim that this method provides a similar decrease in air emissions, decrease in mobility, and potential reduction in leachability to that of amalgamation with zinc.

Based on available information, the Agency is establishing the treatment standard for D009 and U151 elemental mercury wastes contaminated with radioactive materials as amalgamation with zinc.

Comment Number: 10- H-1
Docket Number: LD12-00132
Commenter: THE CHLORINE INSTITUTE
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: INDIGENOUS WASTE
Comment:

Discussion

As indicated, the Institute and its members are particularly concerned with one aspect of this Agency's proceeding on the burning of hazardous waste in boilers and industrial furnaces: the definition under RCRA of "indigenous" waste that is reclaimed. This interest arises from the fact that in the parallel BDAT Proposal under Section 3004(m), EPA is proposing to mandate roasting or retorting of K106, K071, and D009 nonwastewaters prior to land disposal (where the waste in question has a total mercury content greater than or equal to 16 mk/kg). 54 Fed. Reg. 48441-43.

In its original May 6, 1987 notice on burning hazardous waste in boilers and industrial furnaces, 52 Fed. Reg. 16982, EPA solicited comments on the issue of when a hazardous waste that was burned exclusively for materials recovery might be considered "indigenous" to the industrial furnace in which it was placed. As the Agency pointed out at that time:

> Under current regulations, hazardous spent materials, listed sludges, and listed by-products are hazardous wastes when reclaimed...[H]owever, these materials may cease being solid wastes at the point of burning for material recovery in industrial furnaces depending on the type of secondary material involved...To date, EPA has indicated that burning for materials recovery of secondary materials is "indigenous" to the process in which the industrial furnace is used and is beyond the Agency's RCRA jurisdiction.

52 Fed. Reg. 16989-90 (first emphasis in original, second emphasis supplied). In other words, where the secondary material being burned is indigenous to the industrial process for which the furnace is being used -- in this case reclamation -- regulation of the material under RCRA once the material is placed in the furnace leads to an "impermissible intrusion" into the production process. Id.; see, also 50 Fed. Reg. 49167, November 29, 1985.

However, EPA's May 6, 1987, notice proposed that "only materials generated by a process using the same type of industrial furnace as that in which burning occurs" would be classified as indigenous. 52 Fed. Reg. 16990 (emphasis in original). That position, in turn, ultimately raised a problem for chlorine producers one year later. On May 18, 1988, EPA first proposed roasting or retorting as the BDAT for K106, 53 Fed. Reg. 17601-02. In its notice, the Agency also opined that "K106 sludge would not be considered indigenous, under the May 6, [1987] proposal, to retort furnaces used as the basis for the proposed [BDAT] treatment standard." 53 Fed. Reg. 17602. Under that logic, the residuals produced by the furnace automatically would be deemed hazardous waste by virtue of the "derived-from" rule, 40 CFR 261.2(c), because the residual would be deemed derived-from a listed waste. Id. Conversely, as EPA pointed out, if a determination of indigenous was made for K106 in this circumstance, "it would cease to be a solid waste when it is retorted." Id. The derived-from rule thus would be inapplicable, and the residual only would be a hazardous waste if it exhibited a characteristic of a hazardous waste. Id.

As it developed, the Agency withdrew its May 1988 BDAT proposal for K106, and instead let the so-called "soft hammer" provision of Section 3004 apply. 53 Fed. Reg. 31173, August 17, 1988. But, as already discussed, this past November the Agency reproposed roasting or retorting as the mandated BDAT technology for nonwastewaters in the K106, K071, and D009 category, so that the indigenous issue also remains.

Returning to the instant proceeding on boilers and industrial furnaces, on October 29, 1989 EPA reopened the general issue of indigenous wastes. 54 Fed. Reg. 43718. EPA solicits comments on a different option from that contained in the May 1987 notice, proposing now that the test for indigenous waste "vary according to the source of the waste..." 54 Fed. Reg. 42731.

With respect to SIC code 33 industrial furnaces burning wastes generated by a process

Comment Number: 10- H-1

Docket Number: LD12-00132

Commenter: THE CHLORINE INSTITUTE

Issue: MERCURY CHARACTERISTIC WASTE (D009)

Subissue: INDIGENOUS WASTE

Comment:

other then SIC code 33 -- which, among other things, describes the roasting or retorting of K106, K071, and D009 -- EPA states: "the Agency is tentatively of the view that [the] material...would only be indigenous to the furnace if it contained unrecovered toxic constitutents present in the waste in insignificant concentration, *i.e.,* less than 500 PPM for total Appendix VIII organic compounds and 500 PPM for total unreclaimed Appendix VIII toxic metals." 54 *Fed*. *Reg*. 43732.

It is the position of the Chlorine Institute that K106, K071, and D009 (nonwastewaters) *must* be deemed indigenous to the roasting or retorting process proposed by EPA as the BDAT technology under Section 3004(m). In the context of such thermal recovery, the relevant mercury bearing wastes are not being placed into an industrial furnace for the purpose or the effect of incineration. Neither are they being placed there for the purpose or effect (in whole or in part) of energy recovery. That being the case, the basic statutory predicate under RCRA for continued regulation of the material as *listed* wastes -- and, thus, continued application of the derived-from rule -- is absent once the material is placed into the furnace. *See, generally* EPA notices published at 50 *Fed*. *Reg*. 630, January 4, 1985; 50 *Fed*. *Reg*. 1690, January 11, 1985. Under the very terms of the Agency's own November 29, 1989 BDAT proposal (and the companion November 1989 "Background Document for Mercury Wastes"), the sole purpose and effect of placing the K106/K071/D009 into the roasting or retorting furnace is the *recovery* of the mercury. Indeed, that is the whole point in mandating roasting or retorting as a specified BDAT technology.

In this circumstance, the waste is placed into the furnace *as an in-process material which is not discarded*. Therefore, control of the burning of the material in the furnace would constitute that "impermissible intrusion into the production process" which EPA long has recognized as beyond its authority under RCRA. In this limited circumstance, the K106, K071 or D009 (as appropriate) is indigenous to the process for which the furnace is used.

Conclusion

For these reasons, while the Institute supports the thrust of the Agency's general proposal in its October 26, 1989 notice with respect to the burning in SIC code 33 industrial furnaces of wastes generated by other processes (and the recognition by EPA of the need for a defined category of indigenous waste when dealing with recovery), the Institute also urges the Agency specifically to find that where K106, K071 or D009 are placed into a roasting or retorting facility for the purpose of complying with EPA's final BDAT rules for these wastes, the K106, K071 or D009 (as appropriate) shall automatically be deemed indigenous.

Very truly yours,

Robert G. Smerko

Robert G. Smerko

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COMMENT NUMBER:	10-H-1
DOCKET NUMBER:	LD12-00132
COMMENTER:	THE CHLORINE INSTITUTE
ISSUE:	Mercury Characteristic Waste (D009)
SUBISSUE:	Indigenous Waste
RESPONSE:	

This commenter, as well as other commenters, have raised questions concerning the issue of whether residues from the retorting/roasting of K106, K071, U151, and D009 nonwastewaters will be considered "indigenous" wastes. The following paragraphs explain the status of retorter/roaster residues according to the promulgated BDAT standards.

Under the promulgated standards, High Mercury Subcategory K106, D009 and U151 nonwastewaters (i.e., untreated wastes contain 260 mg/kg or greater total mercury) are required to be treated by roasting/retorting as a prerequisite for land disposal. For D009 wastes with an organic content initially too high for retorting/roasting, incineration should be used as a pretreatment step. Residues from retorting/roasting are not prohibited from land disposal unless they leach mercury above 0.20 mg/l, as measured by TCLP (i.e., the toxic characteristic level). Available data indicate that residues from retorting will leach mercury at levels less than 0.20 mg/l. Residues leaching more than 0.20 mg/l mercury will be required either to undergo further treatment to achieve compliance with the standard or will require a variance.

Under the promulgated standards, Low Mercury Subcategory K106 and U151 nonwastewaters (i.e., untreated wastes contain less than 260 mg/kg total mercury) must comply with a treatment standard of 0.025 mg/l as measured by TCLP. Wastes that leach less than 0.025 mg/l are considered to have met BDAT and can be land disposed. Wastes that leach 0.025 mg/l or more must be treated to achieve compliance with the standard. If the nonwastewater residues formed from precipitating the acid leachate from the acid leaching

COMMENT NUMBER: 10-H-1 (continued)
DOCKET NUMBER: LD12-00132
COMMENTER: THE CHLORINE INSTITUTE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

process, or whatever process is selected to treat the non-compliant waste, contain 260 mg/kg or more of total mercury, then the waste must undergo retorting/roasting and comply with the appropriate standards for High Mercury Subcategory D009 nonwastewaters.

With respect to K071 nonwastewaters, EPA has decided to retain the existing promulgated standards which do not require retorting/roasting.

EPA is not addressing the issue here of whether mercury wastes being retorted would be indigenous to the retorting furnace. EPA has determined that retorting is Best Demonstrated Available Technology. Residues from a designated treatment method are no longer subject to the disposal prohibition. This determination does not rest on a finding one way or the other on the issue of indigenous. That issue is the subject of a pending rulemaking and also a pending D.C. Circuit decision in API v. EPA, no. 88-1606. The Agency will undoubtedly consider the issue further in either or both of these contexts.

Comment Number: 10- H-2
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: INDIGENOUS WASTE
Comment:

Status of K106, K071 and D009 Non-wastewaters as Indigenous Waste When Placed in Retorting Furnace

It is the position of Pioneer that when K106, K071 and D009 non-wastewaters are placed into a roasting or retorting furnace for the purpose of complying with the final BDAT rules, the K106, K071 and D009 wastes (as appropriate) automatically shall be deemed "indigenous" to the furnace — and no longer a RCRA solid waste at that point.

Pioneer has already submitted comments outlining this position in the Agency proceeding in Docket No. F-80-BBSP-FFFFF, Burning of Hazardous Waste in Boilers and Industrial Furnaces. A copy of these comments, dated December 21, 1989, are attached hereby as Attachment 2.

PIONEER

December 21, 1989

RCRA Docket Section (OS-305)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

ATTN: Docket No. F-80-BBSP-FFFFF
Burning of Hazardous Waste In
Boilers and Industrial Furnaces

PIONEER CHLOR ALKALI COMPANY, INC. COMMENTS TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY'S PROPOSAL ON THE DEFINITION OF "INDIGENOUS WASTE"

Introduction

Pioneer Chlor Alkali Company, Inc. (Pioneer) manufactures chlorine by the electrolytic mercury cell process at its St. Gabriel, La. facility. This process generates mercury bearing waste water treatment sludges (listed by EPA as RCRA hazardous waste K106); mercury bearing brine purification muds (listed as K071); and (in some cases) residual miscellaneous materials contaminated with elemental mercury (listed as D009).

In a related rulemaking under RCRA Section 3004(m), EPA is proposing to mandate thermal recovery (roasting or retorting) as the best demonstrated available technology ("BDAT") for treatment of certain K106, K071 and D009 nonwastewaters prior to land disposal. Land Disposal Restrictions for Third Scheduled Wastes, 54 Fed. Reg. 48372, November 22, 1989 (hereafter the "BDAT Proposal"). To the extent that the Agency's BDAT Proposal is ultimately adopted, it is the position of Pioneer in the instant proceeding that K106, K071 and D009 nonwastewaters be deemed indigenous wastes when placed into a roasting or retorting furnace for the purpose of complying with EPA's BDAT regulations.

Comment Number: 10-H-2
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: INDIGENOUS WASTE
Comment:

Discussion

Pioneer is particularly concerned with one aspect of this proceeding on the burning of hazardous waste in boilers and industrial furnaces: the definition under RCRA of "indigenous" waste that is reclaimed. This interest arises from the fact that in the parallel BDAT Proposal under Section 3004(m), EPA is proposing to mandate roasting or retorting of K106, K071 and D009 nonwastewaters prior to land disposal (where the waste in question has a total mercury content greater than or equal to 16 mg/kg). 54 Fed. Reg. 48441-43.

In its original May 6, 1987 notice on burning hazardous waste in boilers and industrial furnaces, 52 Fed. Reg. 16982, EPA solicited comments on the issue of when a hazardous waste that was burned exclusively for materials recovery might be considered "indigenous" to the industrial furnace in which it was placed. As the Agency pointed out at that time:

> Under current regulations, hazardous spent materials, listed sludges, and listed by-products are hazardous wastes when reclaimed . . . [H]owever, these materials may cease being solid wastes at the point of burning for material recovery in industrial furnaces depending on the type of secondary material involved . . . To date, EPA has indicated that burning for materials recovery of secondary materials is "indigenous" to the process in which the industrial furnace is used and is beyond the Agency's RCRA jurisdiction.

52 Fed. Reg. 17389-90 (first emphasis in original, second emphasis supplied). In other words, where the secondary material being burned is indigenous to the industrial process for which the furnace is being used — in this case reclamation — regulation of the material under RCRA once the material is placed in the furnace leads to an "impermissible intrusion" into the production process. Id; see, also 50 Fed. Reg. 49167 November 29, 1985.

However, EPA's May 6, 1987 notice proposed that only materials generated by a process using the same type of industrial furnace as that in which burning occurs" would be classified as indigenous. 52 Fed. Reg. 16990 (emphasis in original). That position in turn, ultimately raised a problem for chlorine producers one year later. On May 18, 1988 EPA first proposed roasting or retorting as the BDAT for K106, 53 Fed. Reg. 17601-02. In the notice the Agency also opined that "K106 sludge would not be considered indigenous, under the May 6, [1987] proposal, to retort furnaces used as the basis for the proposed [BDAT] treatment standard." 53 Fed. Reg. 17602. Under that logic, the residuals produced by the furnace automatically would be deemed hazardous waste by virtue of the "derived-from" rule, 40 CFR 261.2(c), because the residual would be deemed derived-from a listed waste. Id. Conversely, as EPA pointed out, if a determination of indigenous was made for K106 in this circumstance, "it would cease to be a solid waste when it is retorted." Id. The derived-from rule thus would be inapplicable, and the residual only would be a hazardous waste if it exhibited a characteristic of a hazardous waste. Id.

As it developed, the Agency withdrew its May 1988 BDAT proposal for K106, and instead let the so-called "soft hammer" provision of Section 3004 apply. 53 Fed. Reg. 31173, August 17, 1988. but, as already discussed, this past November the Agency reproposed roasting or retorting as the mandated BDAT technology for nonwastewaters in the K106, K071 and D009 category, so that the indigenous issue also remains.

Comment Number: 10-H-2
Docket Number: LD12-00265
Commenter: PIONEER
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: INDIGENOUS WASTE
Comment:

Returning to the instant proceeding on boilers and industrial furnaces, on October 29, 1989 EPA reopened the general issue of indigenous wastes. 54 *Fed. Reg.* 43718. EPA solicits comments on a different option from that contained in the May 1987 notice, proposing now that the test for indigenous waste "very according to the source of the waste . . . " 54 *Fed. Reg.* 42731.

With respect to SIC code 33 industrial furnaces burning wastes generated by a process other than SIC code 33 — which, among other things, describes the roasting or retorting of K106, K071 and D009 — EPA states: "the Agency is tentatively of the view that [the] material . . . would only be indigenous to the furnace if it contained unrecovered toxic constitutents present in the waste in insignificant concentration, i.e., less than 500 PPM for total Appendix VIII organic compounds and 500 PPM for total unreclaimed Appendix VIII toxic metals." 54 *Fed. Reg.* 43743.

It is the position of Pioneer that K106, K071 and D009 (nonwastewaters) *must* be deemed indigenous to the roasting or retorting process proposed by EPA as the BDAT technology under Section 3004(m). In the context of such thermal recovery, the relevant mercury bearing wastes are not being placed into an industrial furnace for the purpose or effect of incineration. Neither are they being placed there for the purpose or effect (in whole or in part) of energy recovery. That being the case, the basic statutory predicate under RCRA for continued regulation of the material as *listed* wastes — and, thus, continued application of the derived-from rule — is absent once the material is placed into the furnace. *See, generally* EPA notices published at 50 *Fed. Reg.* 630, January 4, 1985; 50 *Fed. Reg.* 1690, January 11, 1985. Under the very terms of the Agency's own November 29, 1989 BDAT proposal (and the companion November 1989 "Background Document for Mercury Wastes"), the sole purpose and effect of placing the K106/K071/D009 into the roasting or retorting furnace is the *recovery* of mercury. Indeed, that is the whole point in mandating roasting or retorting as a specified BDAT technology.

In this circumstance, the waste is placed into the furnace *as an in-process material which is not discarded*. Therefore, control of the burning of the material in the furnace would constitute that "impermissible intrusion into the production process" which EPA long has recognized as beyond its authority under RCRA. In this limited circumstance, the K106, K071 and D009 (as appropriate) is indigenous to the process for which the furnace is used.

Conclusion

For these reasons, while Pioneer supports the Agency's general proposal in its October 26, 1989 notice with respect to the burning in SIC code 33 industrial furnaces of wastes generated by other processes, Pioneer urges the Agency to also find that where K106, K071 or D009 are placed into a roasting or retorting facility for the purpose of complying with EPA's final BDAT rules for these wastes, the K106, K071 and D009 (as appropriate) shall automatically be deemed indigenous.

Respectfully Submitted,

B.L. Bennett

B.L. Bennett
Plant Manager

COMMENT NUMBER: 10-H-2
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

This commenter, as well as other commenters, have raised questions concerning the issue of whether residues from the retorting/roasting of K106, K071, U151, and D009 nonwastewaters will be considered "indigenous" wastes. The following paragraphs explain the status of retorter/roaster residues according to the promulgated BDAT standards.

Under the promulgated standards, High Mercury Subcategory K106, D009 and U151 nonwastewaters (i.e., untreated wastes contain 260 mg/kg or greater total mercury) are required to be treated by roasting/retorting as a prerequisite for land disposal. For D009 wastes with an organic content initially too high for retorting/roasting, incineration should be used as a pretreatment step. Residues from retorting/roasting are not prohibited from land disposal unless they leach mercury above 0.20 mg/l, as measured by TCLP (i.e., the toxic characteristic level). Available data indicate that residues from retorting will leach mercury at levels less than 0.20 mg/l. Residues leaching more than 0.20 mg/l mercury will be required either to undergo further treatment to achieve compliance with the standard or will require a variance.

Under the promulgated standards, Low Mercury Subcategory K106 and U151 nonwastewaters (i.e., untreated wastes contain less than 260 mg/kg total mercury) must comply with a treatment standard of 0.025 mg/l as measured by TCLP. Wastes that leach less than 0.025 mg/l are considered to have met BDAT and can be land disposed. Wastes that leach 0.025 mg/l or more must be treated to achieve compliance with the standard. If the nonwastewater residues formed from precipitating the acid leachate from the acid leaching

COMMENT NUMBER: 10-H-2 (continued)
DOCKET NUMBER: LD12-00265
COMMENTER: PIONEER
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

process, or whatever process is selected to treat the non-compliant waste, contain 260 mg/kg or more of total mercury, then the waste must undergo retorting/roasting and comply with the appropriate standards for High Mercury Subcategory D009 nonwastewaters.

With respect to K071 nonwastewaters, EPA has decided to retain the existing promulgated standards which do not require retorting/roasting.

EPA is not addressing the issue here of whether mercury wastes being retorted would be indigenous to the retorting furnace. EPA has determined that retorting is Best Demonstrated Available Technology. Residues from a designated treatment method are no longer subject to the disposal prohibition. This determination does not rest on a finding one way or the other on the issue of indigenous. That issue is the subject of a pending rulemaking and also a pending D.C. Circuit decision in API v. EPA, no. 88-1606. The Agency will undoubtedly consider the issue further in either or both of these contexts.

Comment Number: 10- H -3
Docket Number: LD 12-00 129
Commenter: OLIN
Issue: MERCURY CHARACTERISTIC WASTE (D009)
Subissue: INDIGENOUS WASTE
Comment:

D009 wastes, derived from chlor-alkali operations, anticipated to be suitable for thermal treatment are: spent activated carbon, cell house trench and sump cleanings, thick mercury sludge, decomposer packing, and spent caustic filter cake. These wastes are currently being retorted for mercury recovery. Olin believes that these D009 wastes should be subject to a BDAT "treatment" standard of "roasting or retorting" with no associated residue numerical "performance" standard.

Olin recommends that if the Agency maintains the BDAT as retorting or roasting, that the residue from roasting or retorting of all mercury wastes (K106, U151, K071 and D009) be allowed to be disposed of as non-hazardous waste if the wastes are characteristically non-hazardous. The BDAT roasting or retorting proposal is based upon the proposal for indigenous thermal treatment of mercury containing wastes, thereby qualifying such treatment residue to be disposed of as non-hazardous.

COMMENT NUMBER: 10-H-3
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

This commenter, as well as other commenters, have raised questions concerning the issue of whether residues from the retorting/roasting of K106, K071, U151, and D009 nonwastewaters will be considered "indigenous" wastes. The following paragraphs explain the status of retorter/roaster residues according to the promulgated BDAT standards.

Under the promulgated standards, High Mercury Subcategory K106, D009 and U151 nonwastewaters (i.e., untreated wastes contain 260 mg/kg or greater total mercury) are required to be treated by roasting/retorting as a prerequisite for land disposal. For D009 wastes with an organic content initially too high for retorting/roasting, incineration should be used as a pretreatment step. Residues from retorting/roasting are not prohibited from land disposal unless they leach mercury above 0.20 mg/l, as measured by TCLP (i.e., the toxic characteristic level). Available data indicate that residues from retorting will leach mercury at levels less than 0.20 mg/l. Residues leaching more than 0.20 mg/l mercury will be required either to undergo further treatment to achieve compliance with the standard or will require a variance.

Under the promulgated standards, Low Mercury Subcategory K106 and U151 nonwastewaters (i.e., untreated wastes contain less than 260 mg/kg total mercury) must comply with a treatment standard of 0.025 mg/l as measured by TCLP. Wastes that leach less than 0.025 mg/l are considered to have met BDAT and can be land disposed. Wastes that leach 0.025 mg/l or more must be treated to achieve compliance with the standard. If the nonwastewater residues formed from precipitating the acid leachate from the acid leaching DOCKET

COMMENT NUMBER: 10-H-3 (continued)
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

process, or whatever process is selected to treat the non-compliant waste, contain 260 mg/kg or more of total mercury, then the waste must undergo retorting/roasting and comply with the appropriate standards for High Mercury Subcategory D009 nonwastewaters.

With respect to K071 nonwastewaters, EPA has decided to retain the existing promulgated standards which do not require retorting/roasting.

EPA is not addressing the issue here of whether mercury wastes being retorted would be indigenous to the retorting furnace. EPA has determined that retorting is Best Demonstrated Available Technology. Residues from a designated treatment method are no longer subject to the disposal prohibition. This determination does not rest on a finding one way or the other on the issue of indigenous. That issue is the subject of a pending rulemaking and also a pending D.C. Circuit decision in API v. EPA, no. 88-1606. The Agency will undoubtedly consider the issue further in either or both of these contexts.

Comment Number: 10- H-4

Docket Number: LD12-L0018

Commenter: McDermitt Mine

Issue: Mercury Characteristic Waste (D009)

Subissue: Indigenous Waste

Comment:

Section III-A.314 (7): Our D009 non-waste water likely will fall into the high mercury sub-category but was produced from BDAT roasting. Due to its low value it is not economic to re-roast. Furthermore if I put it back into the production roaster there is no guarantee that it would not exit the roaster as it did on the 1st cycle. What then are my options?

COMMENT NUMBER: 10-H-4
DOCKET NUMBER: LD12-L0018
COMMENTER: McDERMITT MINE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

This commenter, as well as other commenters, have raised questions concerning the issue of whether residues from the retorting/roasting of K106, K071, U151, and D009 nonwastewaters will be considered "indigenous" wastes. The following paragraphs explain the status of retorter/roaster residues according to the promulgated BDAT standards.

Under the promulgated standards, High Mercury Subcategory K106, D009 and U151 nonwastewaters (i.e., untreated wastes contain 260 mg/kg or greater total mercury) are required to be treated by roasting/retorting as a prerequisite for land disposal. For D009 wastes with an organic content initially too high for retorting/roasting, incineration should be used as a pretreatment step. Residues from retorting/roasting are not prohibited from land disposal unless they leach mercury above 0.20 mg/l, as measured by TCLP (i.e., the toxic characteristic level). Available data indicate that residues from retorting will leach mercury at levels less than 0.20 mg/l. Residues leaching more than 0.20 mg/l mercury will be required either to undergo further treatment to achieve compliance with the standard or will require a variance.

Under the promulgated standards, Low Mercury Subcategory K106 and U151 nonwastewaters (i.e., untreated wastes contain less than 260 mg/kg total mercury) must comply with a treatment standard of 0.025 mg/l as measured by TCLP. Wastes that leach less than 0.025 mg/l are considered to have met BDAT and can be land disposed. Wastes that leach 0.025 mg/l or more must be treated to achieve compliance with the standard. If the nonwastewater residues formed from precipitating the acid leachate from the acid leaching

COMMENT NUMBER: 10-H-4 (Continued)
DOCKET NUMBER: LD12-L0018
COMMENTER: McDERMITT MINE
ISSUE: Mercury Characteristic Waste (D009)
SUBISSUE: Indigenous Waste
RESPONSE:

process, or whatever process is selected to treat the non-compliant waste, contain 260 mg/kg or more of total mercury, then the waste must undergo retorting/roasting and comply with the appropriate standards for High Mercury Subcategory D009 nonwastewaters.

With respect to K071 nonwastewaters, EPA has decided to retain the existing promulgated standards which do not require retorting/roasting.

EPA is not addressing the issue here of whether mercury wastes being retorted would be indigenous to the retorting furnace. EPA has determined that retorting is Best Demonstrated Available Technology. Residues from a designated treatment method are no longer subject to the disposal prohibition. This determination does not rest on a finding one way or the other on the issue of indigenous. That issue is the subject of a pending rulemaking and also a pending D.C. Circuit decision in API v. EPA, no. 88-1606. The Agency will undoubtedly consider the issue further in either or both of these contexts.

ISSUE CODE 11: K044, K045, K047 - Wastes from the Manufacturing and Processing of Explosives

A. Treatment Standard

Comment Number: 11-A-1
Docket Number: LD12-00126
Commenter: IRECO INC.
Issue: K044, K045, K047- Wastes from the Manufacture and Processing of Explosives
Subissue:
Comment: Treatment Standard

A. Deactivation and Thermal Destruction as Treatment Methods

Of greatest concern to IRECO are the Agency's proposals for treatment of listed and characteristic explosive and oxidizer wastes. Our primary concern is that a variety of waste treatment methods, including open burning and open detonation, remain available for treatment of these wastes.

We agree with the Agency's statement with respect to the D001 Oxidizers and D003 Explosives, that "there appear to be a further variety of different waste groups [within these groups], each with a certain degree of uniqueness with respect to handling requirements." 54 Fed. Reg. at 48419. IRECO also agrees with the Agency's conclusion that there is no "one particular technology . . . generally applicable to all the wastes within each particular characteristic subcategory, nor . . . is one particular technology . . . 'Best.'" The great variety of commercial explosive wastes and the considerations for employing one or another method of treatment are described in the Institute of Makers of Explosives' (IME's) RCRA Guidance Manual for Permitting Commercial Explosives Industry Open Burning/Open Detonation Units, which the IME will be submitting along with comments on the proposed rules.

The Agency has proposed "deactivation as a method of treatment" for D001 Oxidizers, D003 Explosives, and listed explosives wastes K044, K045 and K047. Additionally, the Agency has proposed "thermal destruction" as a method of treatment for listed waste P081, nitroglycerin. The Agency mentions a number of examples of deactivation, including open detonation, incineration, chemical oxidation and others. We assume that the Agency intended to include open burning even though it is not specifically mentioned. Open burning, rather than open detonation, is probably the most commonly used method of treating explosive waste and we would appreciate clarification of the Agency's intent in this regard.

Comment Number: 11-A-1 (Continuation)
Docket Number: LD12-00126
Commenter: IRECO Inc.
Issue: K044, K045, K047 - Wastes from the Manufacture and Processing of Explosives
Subissue: Treatment Standard
Comment:

B. Alternative Proposals

The need to have a variety of methods available for disposing of various types of explosive waste is also the reason we are less favorably disposed toward the Agency's alternative proposals for these wastes. For example, the alternative suggested at page 48419, column 3, to 48420, column 1, listing specific treatment technologies as methods of treatment, appears more restrictive. Again, it is not clear that "thermal destruction" is intended to include open burning and open detonation, although we assume from the prior comments that that is the intent of the proposal. Nonetheless, we have a concern that, without clarification, this proposal might be read more restrictively than the Agency intends.

IRECO is adamantly opposed to the second alternative of specifying one technology (e.g., open detonation) for all wastes that could be included in each subcategory. As mentioned above, there is a large variety of explosive wastes, some of which are amenable to one type of treatment such as open detonation, while other types are amenable only to another type of treatment such as open burning. This alternative would not allow the needed flexibility in treatment methods.

In summary, we believe that the Agency's proposal of deactivation as a treatment method is the best of the alternatives proposed. Another alternative the Agency may wish to consider, however, that would serve the same purpose, is to promulgate "nonreactive" as a treatment standard for D003 Explosives and "nonignitable" as a treatment standard for D001 Oxidizers. This proposal would maximize flexibility, while leaving selection of treatment method to the permitting process.

COMMENT NUMBER:	11-A-1
DOCKET NUMBER:	LD12-00126
COMMENTER:	IRECO
ISSUE:	K044, K045, and K047: Wastes from the Manufacture and Processing of Explosives
SUBISSUE:	Treatment Standard

RESPONSE:

The Agency proposed a treatment standard of "Deactivation as a Method of Treatment" for K044, K045, and K047 wastes. The Agency took this approach for these wastes since the hazardous characteristic is based on imminent hazard (i.e., reactivity) rather than on other criteria such as levels of hazardous constituents, and that technologies exist that can completely remove this characteristic. Once the characteristic of reactivity has been removed from K044, K045, and K047, the waste is no longer considered to be hazardous.

The Agency believes that technologies such as chemical oxidation, chemical reduction, incineration, biodegradation, and carbon adsorption are all applicable technologies for K044, K045, and K047 wastewaters and nonwastewaters because they will remove the characteristic of reactivity. However, the Agency believes that because of the diversity in physical and chemical forms of these wastes, it is not possible to determine a "best" technology for all waste types. EPA is therefore promulgating a treatment standard of "Deactivation (DEACT) as a Method of Treatment" for K044, K045, and K047 wastewaters and nonwastewaters. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR Appendix VI. See also 40 CFR 268.42 Table 1 for a description of the technologies referred to by the five letter technology code in parentheses. The Agency believes that this treatment standard will provide both generators and treaters the flexibility needed to adequately treat the wide variety of K044, K045, and K047 wastes.

COMMENT NUMBER: 11-A-2
DOCKET NUMBER: LD12-00106
COMMENTER: Institute of Makers of Explosives
ISSUE: K044, K045, and K047 - Wastes from the Manufacture and Processing of Explosives
SUBISSUE: Treatment Standard
COMMENT:

The Institute of Makers of Explosives (IME) is pleased to submit these comments in response to your November 22, 1989, Federal Register notice (54 Fed. Reg. 48371) proposing land disposal restrictions for the third scheduled wastes.

The IME is the safety association of the commercial explosives industry in the United States and Canada. It is a nonprofit, incorporated association concerned primarily with safety in the manufacture, transportation, storage, handling and use of explosives materials in blasting and other essential applications. The association has been in existence for over 75 years and has extensive experience in addressing safety issues, especially those arising as a result of the disposal of explosive waste.

Deactivation as a Method of Treatment Standard

The Environmental Protection Agency (EPA) has proposed "Deactivation as a Method of Treatment" for several subcategories of D001, D002, and D003 wastes. Two of the subcategories of characteristic waste are associated with manufacturing and handling of commercial explosives, D001 Oxidizers and D003 Explosives. The Agency has also proposed "Deactivation as a Method of Treatment" for K044, K045 and K047 wastes, which are also associated with commercial explosives manufacturing.

IME concurs with EPA's determination that there are a variety of different waste groups within these subcategories and that each waste has a "certain degree of uniqueness with respect to hazard and handling requirements." Therefore, the "method of 'deactivation' chosen for each waste may be specific to that waste and may be best determined by the generator or the treator most knowledgeable as to the waste's unique hazards and handling requirements."

EPA does not believe it can identify a best demonstrated available technology (BDAT) for "deactivation" of D001, D002 and D003 wastes; however, it does list "forms of deactivation." IME notes that EPA included open detonation as a "form of deactivation" but did not include open burning. IME presumes that EPA did not intend to preclude open burning as a "form of deactivation."

COMMENT NUMBER: 11-A-2
DOCKET NUMBER: LD12-00106
COMMENTER: Institute of Makers of Explosives
ISSUE: K044, K045, and K047: Wastes from the Manufacture and Processing of Explosives
SUBISSUE: Treatment Standard
RESPONSE:

The Agency proposed a treatment standard of "Deactivation as a Method of Treatment" for K044, K045, and K047 wastes. The Agency took this approach for these wastes since the hazardous characteristic is based on imminent hazard (i.e., reactivity) rather than on other criteria such as levels of hazardous constituents, and that technologies exist that can completely remove this characteristic. Once the characteristic of reactivity has been removed from K044, K045, and K047, the waste is no longer considered to be hazardous.

The Agency believes that technologies such as chemical oxidation, chemical reduction, incineration, biodegradation, and carbon adsorption are all applicable technologies for K044, K045, and K047 wastewaters and nonwastewaters because they will remove the characteristic of reactivity. However, the Agency believes that because of the diversity in physical and chemical forms of these wastes, it is not possible to determine a "best" technology for all waste types. EPA is therefore promulgating a treatment standard of "Deactivation (DEACT) as a Method of Treatment" for K044, K045, and K047 wastewaters and nonwastewaters. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR Appendix VI. See also 40 CFR 268.42 Table 1 for a description of the technologies referred to by the five letter technology code in parentheses. The Agency believes that this treatment standard will provide both generators and treaters the flexibility needed to adequately treat the wide variety of K044, K045, and K047 wastes.

COMMENT NUMBER: 11-A-3
DOCKET NUMBER: LD12-00126
COMMENTER: IRECO INC.
ISSUE: K044, K045, K047 Wastes from the Manufacture and Processing of Explosives
SUBISSUE: Treatment Standard
COMMENT:

The Agency has proposed "deactivation as a method of treatment" for D001 Oxidizers, D003 Explosives, and listed explosives wastes K044, K045 and K047. Additionally, the Agency has proposed "thermal destruction" as a method of treatment for listed waste P081, nitroglycerin. The Agency mentions a number of examples of deactivation, including open detonation, incineration, chemical oxidation and others. We assume that the Agency intended to include open burning even though it is not specifically mentioned. Open burning, rather than open detonation, is probably the most commonly used method of treating explosive waste and we would appreciate clarification of the Agency's intent in this regard.

COMMENT NUMBER: 11-A-3
DOCKET NUMBER: LD12-00126
COMMENTER: IRECO
ISSUE: K044, K045, and K047: Wastes from the Manufacture and Processing of Explosives
SUBISSUE: Treatment Standard
RESPONSE:

The commenter raised a concern regarding the applicability of 261.3(a)(2)(3) (pertaining to the definition of hazardous waste, in particular mixtures of hazardous wastes and solid wastes) to K044, K045, and K047 wastes. The Agency, upon review of the comment, believes that the commenter misinterpreted the relationship between 261.3(a)(2)(3) and the land disposal restrictions. As discussed in the preamble, hazardous wastes are subject to the land disposal restrictions irrespective of 261.3(a)(2)(3). All waste generated as K044, K045, and K047 are prohibited from land disposal unless they comply with the treatment standards or are otherwise exempted from the prohibition, as such through a no migration petition or by a capacity variance. As such, the Agency is promulgating a treatment standard of deactivation as a method of treatment for K044, K045, and K047 wastewaters and nonwastewaters.

ISSUE CODE 12:D011 - Characteristic Wastes for Silver

A.-. Treatment Standards
B.-. Precipitation
C.-. Concentration-based Standards vs. Recovery or Stabilization

Comment Number: 12-A-1
Docket Number: LD12-00225
Commenter: National Association of Photographic Manufacturers, Inc.
Issue: 12 - Silver
Subissue: Treatment Standard
Comment:

EPA recognizes, at 54 FR 48444, that "the treatment standards presented in today's preamble for all silver wastes are based upon a limited amount of treatment data." Based on this limited data and the extremely short comment period with which to gather more data, EPA should not establish treatment standards below the characteristic level of 5 mg/l until such time as the Agency can demonstrate that establishment of a lower level is representative of currently available technology for all D011 wastes.

The selection of the 5 mg/l BDAT level would also be consistent with the proposed rule for the National Primary and Secondary Drinking Water Regulations (54 FR 22062, May 22, 1989). EPA has proposed (54 FR 22139) to delete the MCL for silver "due to the fact that the only adverse effect from exposure to silver is argyria (a discoloration of the skin). EPA considers argyria a cosmetic effect since it does not impair the functioning of the body or present other physiological problems." The characteristic level of 5.0 mg/l for D011 was intended to be 100 times the primary drinking water standard. The selection of this characteristic level for silver as the best demonstrated treatment standard is fully protective of human health and the environment and consistent with demonstrated technology treating photoprocessing wastewater.

Comment Number: 12-A-1

Docket Number: LD12-00225

Commenter: Nat'l Assoc. of Photographic Manufacturers, Inc.

Issue: 12 - Silver

Subissue: Treatment Standard

Response:

The treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-A-2

Docket Number: LD12-00176

Commenter: Kodak

Issue: 12 - Silver

Subissue: Treatment Standard

Comment:

Electrolytic recovery, when used to desilver solutions which can no longer be recycled, can achieve concentrations approaching 5 mg/l with difficulty. Metallic replacement has the ability to achieve effluent of concentrations of less than 1 mg/l; however, this is difficult to do consistently in practice if recovery cartridges alone are used. Likewise, ion exchange can achieve an effluent standard of 1-2 mg/l with dilute solutions. With metallic replacement and ion exchange as the common treatment technology for treating photoprocessing wastes containing silver complexes to reach low levels of silver and with their inability to meet the proposed standard of 0.29 mg/l, the transfer of this standard from the Effluent Guidelines Program is not appropriate. For this reason, EPA should select the second option proposed and establish the treatment standard for D011 wastewaters at the characteristic level of 5.0 mg/l.

Comment Number: 12-A-2
Docket Number: LD12-00176
Commenter: Kodak
Issue: Silver
Subissue: Treatment Standard
Response:

The Agency thanks the commenter for the information on the capability of various technologies to treat siler-containing wastes. Unfortunately, the EPA cannot use this data to set treatment standards since it does not include influent/effluent values, laboratory quality control data on the concentrations cited, or design/operating data.

The treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-A-3
Docket Number: LD12-00143
Commenter: GM
Issue: 12- Silver
Subissue: Treatment Standards
Comment:

Proposed Treatment Standards for Silver

GM supports the Agency's second option (page 48444) of limiting the treatment standard for D011 wastewaters to the characteristic level of 5.0 mg/l, as measured in the leachate generated in the EP Toxicity test. We also recommend that the treatment standard for D011 nonwastewaters be established at the existing characteristic level of 5.0 mg/l, as measured in the leachate generated in the EP Toxicity test.

Comment Number: 12-A-3
Docket Number: LD12-00143
Commenter: GM
Issue: Silver
Subissue: Treatment Standard
Response:

The treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-A-4
Docket Number: LD12-00130
Commenter: Wayne Disposal, Inc.
Issue: 12-Silver
Subissue: Treatment Standards
Comment:

D011 Silver Wastes: Silver wastes usually exist as waste mixtures such as silver cyanide in an ammonium medium from the photographic industry. Treatment to the proposed levels is prohibited by the presence of other metal species, complexing agents (such as ammonia) and organics (such as EDTA, oils and solvents). Thus we are in support of the Agency's regulation of these wastes so that treated wastes no longer exhibit the hazardous characteristic (5.0 mg/L silver) prior to land disposal.

Comment Number: 12-A-4
Docket Number: LD12-00130
Commenter: Wayne Disposal, Inc.
Issue: Silver
Subissue: Treatment Standard
Response:

The Agency thanks the commenter for information on the effect of matrix interferences on treatment. As noted, the treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-A-5

Docket Number: LD12-00113

Commenter: Michigan Disposal, Inc.

Issue: 12- Silver

Subissue: Treatment Standards

Comment:

D011 Silver Wastes: Silver wastes usually exist as waste mixtures such as silver cyanide in an ammonium medium from the photographic industry. Treatment to the proposed levels is prohibited by the presence of other metal species, complexing agents (such as ammonia) and organics (such as EDTA, oils and solvents). Thus we are in support of the Agency's regulation of these wastes so that treated wastes no longer exhibit the hazardous characteristic (5.0 mg/L silver) prior to land disposal.

Comment Number: 12-A-5
Docket Number: LD12-00113
Commenter: Michigan Disposal, Inc.
Issue: Silver
Subissue: Treatment Standard
Response:

The Agency thanks the commenter for information on the effect of matrix interferences on treatment. As noted, the treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-A-6
Docket Number: LD12-00198
Commenter: Department of Energy
Issue: Silver
Subissue: Treatment Standard
Comment:

54 FR 48429, Development of Treatment Standards for EP Toxic Characteristic Metal Wastes.

However, with respect to concentration-based treatment standards, DOE urges that such treatment standards relative to EP Toxic metal RMW be set at the characteristic level concentrations and that stabilization by solidification be considered an acceptable method of treatment to achieve these levels.

Comment Number: 12-A-6

Docket Number: LD12-00198

Commenter: Department of Energy

Issue: Silver

Subissue: Treatment Standard

Response:

The Agency has determined the most desireable waste management technology for D011 waste stream is silver recovery. The Agency realizes, however, that not all nonwastewater and wastewater forms of D011 may be readily amenable to recovery processes. For nonwastewater forms of D011 wastes from which silver cannot be removed, the Agency is in agreement with the commenter and has determined that the best technology is stabilization. The Agency has determined that chemical precipitation followed by filtration represents BDAT for D011 wastewaters. The residues from this process, if they exhibit the characteristic, may then be stabilized with lime, cement, or fly ash formulations prior to land disposal.

The treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-B-1
Docket Number: LD12-00269
Commenter: ASARCO
Issue: Silver
Subissue: Precipitation
Comment:

Silver

Care should be utilized in using chloride precipitation as it may solubilize other metals. Alternatively hydroxide precipitation could be considered.

Comment Number: 12-B-1

Docket Number: LD12-00269

Commenter: ASARCO

Issue: Silver

Subissue: Precipitation

Response:

The Agency has reviewed the chemistry and has determined that sulfide precipitation under alkaline conditions (pH 8-10) effectively removes silver from wastewaters and is more insoluble than hydroxide or chloride precipitants. Alkaline conditions are necessary to avoid generation of hydrogen sulfide gas. The relative insolubility decreases the leaching potential when the precipitate is codisposed with alkaline wastes or materials.

Comment Number: 12- B-2

Docket Number: LD12-00176

Commenter: KODAK

Issue: Silver

Subissue: Precipitation

Comment:

EPA, in developing the treatment standards for silver, has based the selection and performance of treatment technologies on the thinking that "silver typically exists as a monovalent, cationic species." While silver may exist in this free ionic form for some wastes, this is not the case for photoprocessing wastes. Silver typically exists as complexed silver in these wastes. The most common form of silver in photoprocessing wastes is as stable silver thiosulfate complex $[Ag(S_2O_3)_2]^{-3}$, - clearly not a "monovalent, cationic species." This difference in form does not lend photographic wastes to the same waste treatment technologies as other silver bearing wastes such as electroplating solutions. Sodium chloride will not precipitate silver from such solutions, since the thiosulfate is a solvent for silver halides present in photographic emulsions after the development of the silver image.

Comment Number: 12-B-2
Docket Number: LD12-00176
Commenter: KODAK
Issue: Silver
Subissue: Precipitation
Response:

Chloride and hydroxide precipitation will not effectively precipitate silver with thiosulfate present because of the stability of thiosulfate complexes. Chloride precipitation will also not work if free ammonia is present. The Agency believes that sulfide or iodide will effectively treat extremely stable thiosulfate complexes. Industry generally prefers treatment by sulfide rather than iodide.

The Agency has reviewed the chemistry and has determined that sulfide precipitation under alkaline conditions (pH 8-10) effectively removes silver from wastewaters and is more insoluble than hydroxide or chloride precipitants. Alkaline conditions are necessary to avoid generation of hydrogen sulfide gas. The relative insolubility decreases the leaching potential when the precipitate is codisposed with alkaline wastes or materials.

1 of 2.

Comment Number: 12-B-3
Docket Number: LD12-00159
Commenter: Waste Management Inc. & Chem. Waste Mgt. Inc.
Issue: Silver
Subissue: Precipitation
Comment:

EPA has also requested comments on the use of chloride as a specified precipitating reagent for silver (54 Fed. Reg. at 4844), the use of carbonate as a specified precipitating reagent for lead (id. at 48438), and the use of sulfide as a specified precipitation reagent for arsenic and selenium (id. at 48430). As discussed above with regard to barium, WMI believes that EPA should not specify any particular precipitating reagent for particular metals. On a commercially viable scale, wastewaters always contain a mixture of metals and it is impossible to treat the individual metals separately. Moreover, each of the proposed reagents can create problems in certain situations.

If chloride is used to precipitate silver, the pH of the wastewater must be raised to 7 to promote precipitation and a variety of metal salts will precipitate, making it impossible to precipitate the silver selectively. The use of carbonate to treat acid mixtures containing lead creates serious engineering and safety problems because large volumes of carbon dioxide gas will be generated. The use of sulfide presents similarly serious safety concerns because of the toxicity of sulfide and the potential for generation of hydrogen sulfide gas. CWM's Model City facility has had good success treating arsenic and selenium with lime, and views sulfide as the reagent of last choice because of the associated safety problems.

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Comment Number: 12-B-3 (con't)
Docket Number: LD12-00159
Commenter: Waste Mngt. Inc. & Chemical Waste Mngt. Inc
Issue: Silver
Subissue: Precipitation
Comment:

For these reasons, WMI believes that the Agency should not designate specific anions for the precipitation of specific metals. Because the restricted waste must meet all applicable standards, specifying reagents would add no increment of environmental protection. Instead, such a step would merely rob treatment facilities of the flexibility necessary to treat the endless variety of wastes produced in this nation.

Comment Number: 12-B-3

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Mgmt., Inc.

Issue: Silver

Subissue: Precipitation

Response:

The Agency believes that the commenter has misinterpreted the discussion on treatment of toxic metals by precipitation. The Agency is not specifying a precipitating reagent for silver. Since the Agency is promulgating the treatment standard for D011 wastewaters and nonwastewaters at the 5 mg/l characteristic level, one may use any treatment to reach that level, a level below which the waste is considered nonhazardous.

However, the Agency has reviewed the chemistry and has determined that sulfide precipitation under alkaline conditions (pH 8-10) effectively removes silver from wastewaters and is more insoluble than hydroxide or chloride precipitants. Alkaline conditions are necessary to avoid generation of hydrogen sulfide gas. The relative insolubility decreases the leaching potential when the precipitate is codisposed with alkaline wastes or materials.

Comment Number: 12-C-1
Docket Number: LD12-00198
Commenter: Department of Energy
Issue: 12 - Silver
Subissue: Concentration-Based Stnds. vs. "Recovery or Stabilization"
Comment:

54 FR 48445, BDAT for Silver Nonwastewaters.

In the second column of page 48445, EPA states that it is proposing the same concentration based standards for D011 nonwastewaters as for P099 and P104 wastes, however it goes on to state that it is proposing "Recovery or Stabilization as Methods of Treatment." DOE requests correction or clarification on this apparent inconsistency.

Comment Number: 12-C-1

Docket Number: LD12-00198

Commenter: Department of Energy

Issue: Silver

Subissue: Concentration-Based Standards vs. "Recovery or Stabilization"

Response:

The proposed treatment standard for D011 nonwastewaters is specified as a numerical standard for silver (0.072 mg/l in the TCLP leachate) both at 54 FR 48445 and later in the proposed rule at 54 FR 48511. In the discussion of this waste code at 54 FR 48445, EPA discusses "recovery or stabilization as methods of treatment" as an optional technology-based treatment standard for D011. Comments from industry identified certain wastes that could not be treated to the proposed numerical values for D011. Recognizing the diversity of wastes that qualify as hazardous under the D011 classification, EPA has chosen to regulate D011 nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

P099 and P104 wastewater treatment standards are a technology transfer of electroplating sludges treated by stabilization from EPA, Office of Water data. P099 and P104 nonwastewater treatment standards were promulgated in the Second Thirds final rule.

Comment Number: 12-C-2

Docket Number: LD12-00176

Commenter: Kodak

Issue: 12- Silver

Subissue: Concentration-Based Stnds. vs. "Recovery or Stabilization

Comment:

As previously stated, the transfer of standards from the treatment of other silver bearing wastes to the D011 characteristic wastes is not appropriate. For non-wastewaters, the transfer of standards from the stabilization of electroplating sludge to the highly variable D011 characteristic wastes is impractical. One reason, as EPA points out at 54 FR 48445, is that the "data represent stabilization of a waste that originally contained low concentrations of silver." Silver wastes determined to exhibit the characteristic of EP toxicity encompass a wide variety of wastes with highly variable ranges of silver composition. These wastes may be solids amenable to stabilization or recovery, or may be liquid wastes containing organics whose proper treatment may be biological treatment, not incineration. Of the options proposed, the transfer of a treatment standard from the stabilization of electroplating sludge is not appropriate due to the inherent differences between the sludge and the D011 wastes. The establishment of a single treatment method is also not practical in that: 1) recovery of silver from all wastes may not be technically achievable or economically justifiable; 2) stabilization of all D011 wastes prevents the reuse and recovery of a finite, nonrenewable resource; and 3) incineration followed by stabilization also limits the reuse and recovery of silver, and may not be appropriate for some aqueous wastes which are amenable to biological degradation but contain more than 1 percent TOC. For these reasons, EPA should not select any of the options as proposed for D011 non-wastewaters, but as in the case of D011 wastewaters, should establish the characteristic level of 5.0 mg/l as the treatment standard for D011 non-wastewaters.

Comment Number: 12-C-2

Docket Number: LD12-00176

Commenter: Kodak

Issue: Silver

Subissue: Concentration-Based Standards vs. "Recovery or Stabilization"

Response:

The Agency has determined the most desirable waste management technology for D011 waste stream is silver recovery. The Agency realizes, however, that not all nonwastewater and wastewater forms of D011 may be readily amenable to recovery processes. For non-wastewater forms of D011 wastes from which silver cannot be recovered, the best technology has been determined to be stabilization. The Agency has determined that chemical precipitation followed by filtration represents BDAT for D011 wastewaters. The residues from this process may then be stabilized with lime, cement, or fly ash formulations prior to land disposal.

The treatment standards for silver presented in 54 FR 48444 (November 22, 1989) were based upon a limited amount of treatment data. The data available to EPA show that a treatment standard of 0.072 mg/l for nonwastewaters and a 0.29 mg/l for wastewaters are achievable for D011. However, EPA recognizes the diversity of wastes that qualify as hazardous under the D011 classification. Because of this diversity, EPA has chosen to regulate D011 wastewaters and nonwastewaters at 5 mg/l in the TCLP leachate. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

Comment Number: 12-C-3

Docket Number: LD12-00167

Commenter: Westinghouse Electric Corporation

Issue: 12 - Silver

Subissue: Concentration-Based Stnd vs. "Recovery or Stabilization"

Comment:

- EPA proposed the same concentration-based standards for D011 nonwastewaters as for P099 and P104 wastes (54 FR 48445). However, later in the Federal Register, EPA proposed "Recovery or stabilization as Methods of Treatment." It is not clear whether both standards apply or whether one applies in lieu of the other.

Comment Number: 12-C-3
Docket Number: LD12-00167
Commenter: Westinghouse Electric Corporation
Issue: Silver
Subissue: Concentration-Based Standards vs. "Recovery or Stabilization"
Response:

The proposed treatment standard for D011 nonwastewaters is specified as a numerical standard for silver (0.072 mg/l in the TCLP leachate) both at 54 FR 48445 and later in the proposed rule at 54 FR 48511. In the discussion of this waste code at 54 FR 48445, EPA discusses "recovery or stabilization as methods of treatment" as an optional technology-based treatment standard for D011. Comments from industry identified certain wastes that could not be treated to the proposed numerical values for D011 nonwastewaters. Recognizing the diversity of wastes that qualify as hazardous under the D011 classification, EPA has chosen to regulate D011 nonwastewaters at 5 mg/l in the TCLP leachate. This numerical value represents the levels at which the wastes are defined as hazardous. EPA has no data showing that D011 wastes cannot be treated to concentrations less than the 5 mg/l characteristic level, a level below which the waste should be rendered nonhazardous.

P099 and P104 wastewater treatment standards are a technology transfer of electroplating sludges treated by stabilization from EPA, Office of Water data. P099 and P104 nonwastewater treatment standards were promulgated in the Second Thirds final rule.

ISSUE CODE 13: P119, P120 - Vanadium Containing Wastes

A.-. Treatment Technology
B.-. Waste Classification
C.-. Treatment Standards
D.-. Data Submission

Comment Number: 13-A-1
Docket Number: L012-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment Technology
Comment:

EPA proposes "thermal recovery or stabilization as a method of treatment" for P119 and P120 nonwastewaters. See 54 Fed. Reg. at 48447. The Panel supports this proposed standard, except that it should be revised to allow recovery that is not strictly thermal recovery, but rather recovery through the steps of dissolution, chemical precipitation, and thermal treatment. Both ammonium vanadate and vanadium pentoxide are amenable to nonthermal recovery and, in fact, are being widely recovered through dissolution, chemical precipitation, and thermal treatment. For example, one member company recovers between 2000 and 5000 pounds of vanadium per month using this 3-step recovery process.

EPA's limitation in the proposed treatment standard to "thermal recovery" may simply be an oversight. The Panel notes that at 54 Fed. Reg. 48,447/1, EPA refers to the treatment standard it is proposing as "recovery" without any limitation to "thermal recovery." Since the proposed regulatory language is limited to "thermal recovery," however, we urge the Agency to revise it to allow recovery for P119 and P120 nonwastewaters that includes dissolution, chemical precipitation, and thermal treatment.

Comment Number: 13-A-1
Docket Number: LD12-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment Technology
Response:

The Agency is promulgating a treatment standard expressed as a method of treatment: stabilization. Recovery, incineration, or any other pretreatment process is not precluded, however, as long as the residue is stabilized. The Agency believes that the treatment train presented by the commenter is allowable within the final stabilization treatment standard. Dissolution and chemical precipitation are actually pretreatment steps and if they occur in tanks or containers they are allowable. In fact, any pretreatment that occurs in tanks or containers (i.e., that does not constitute land disposal) prior to recovery is not precluded by this treatment standard.

Comment Number: 13-A-2
Docket Number: L012-00271
Commenter: Stratcor
Issue: Vanadium
Subissue: Treatment Technology
Comment:

In the P119-P120 (Nov. 1989) background document the Agency states in Section 3.1.1.(2) on page 3-3 that "Stabilization technologies involve mixing the waste with lime/fly ash mixtures, cement, concrete mixtures, or other formulations, both proprietary and nonproprietary." A reference USEPA 1989b is given as the source of this information.

This reference is not available to us at this time, therefore, we cannot determine its applicability to P119 and P120 vanadium compounds. It is common knowledge that technologies exist for stabilizing some heavy metals such as Zn, Cu, Ni or Cd by fixing with lime, fly ash or cement. Much of this technology is not directly applicable to vanadium. Table 4-1 in the above reference attempts to draw conclusions about P119 and P120 compounds by using performance data collected from incinerator ash produced from K048 and K051 sources. This seems to be an excessive stretching of data. We note that the data in Table 4-1 are TCLP extraction values and not normal solubility data. Values range from 0.148 to 1.4 mg/l after stabilization. It would appear that these levels are inconsistant with and 3 to 33 times more than the proposed BDAT treatment standard for P119 and P120 of 0.042 mg/l. Does this mean that the proposed stabilization treatment may not be effective because the expected wastewater value would be greater than the proposed 0.042 mg/l limi?

We have little problem with the stabilization treatment proposed, but challenge again the proposed wastewater limit of 0.042 mg/l.

Comment Number: 13-A-2
Docket Number: LD12-00271
Commenter: Stratcor
Issue: Vanadium
Subissue: Treatment Technology
Response:

Based on their statements about the proposed background document for P119 and P120, the commenter seems to be confused. The commenter appears to be applying the discussion of applicable technologies for treatment of nonwastewaters (page 3-3) and the table of performance data for stabilization of nonwastewater K048 and K051 (page 4-1) to the proposed P119 and P120 wastewater treatment standard of 0.042 mg/l. The wastewater treatment standard, which seems to be of concern to the commenter, is based on chemical precipitation as BDAT, not stabilization.

It should also be noted that EPA is revising the wastewater treatment standard based on data for P119 and P120 wastewaters submitted as Confidential Business Information during the comment period. The proposed treatment standard was based on data from EPA's Office of Water Effluent Guidelines Program which EPA reexamined and determined that the low concentration values for vanadium was due to dilution. Therefore, EPA is promulgating a revised treatment standard of 28 mg/l based on the data submitted during the comment period.

Comment Number: 13-B-1
Docket Number: LD12-00116
Commenter: Monsanto
Issue: Vanadium
Subissue: Wast Classification
Comment:

In the discussion of P119 and P120 wastes, the Agency says as follows:

> "Vanadium wastes, such as P119 and P120, can be generated as a fly ash or slag from the iron or steel industry or as a spent catalyst from the chemical manufacturing process." 54 FR 48446/2, Nov. 22, 1989.

Such a representation is not supported by the rules under 40 CFR 261 or by other Agency rulemaking on waste classification. For the most part, such described wastes are not P119 or P120, but rather are non-listed wastes from various process sources. They are "hazardous" under RCRA only to the degree that they may be listed as "F" or "K" wastes, or that they are characteristic wastes per 40 CFR 261 Subpart C. The reach of 40 CFR 261.33 listing clearly only goes to discarded "commercial chemical products or manufacturing chemical intermediates having the generic name listed", off-specification species of the same, residues or liners from containers, or residues/soil from spill cleanup.

With regard to spent catalyst, the Agency is reminded that such process-derived wastes are not discarded chemical products or manufacturing chemical intermediates, even though virgin catalyst used by the process may be the named chemical. EPA has explained this rationale clearly in a recent Federal Register notice on CFCs used as refrigerants:

> "The U-list (and, by inference, the P-list) does not include chemical mixtures where the listed chemical is not the sole active ingredient, and does not apply to chemicals that have been used for their intended purpose. Thus, CFC refrigerants that have been removed from a refrigeration system and are reclaimed would not be classified as "commercial products," but rather would be classified as "spent materials." 54 FR 31336/1, July 28, 1989. (Parenthesis added.)

Comment Number: 13-B-1

Docket Number: LD12-00116

Commenter: Monsanto

Issue: Vanadium

Subissue: Waste Classification

Response:

The Agency agrees with the commenter and regrets any confusion caused by the inadvertent inclusion of this statement in the proposed preamble.

Comment Number: 13-B-2
Docket Number: L012-00271
Commenter: Stratcor
Issue: Vanadium
Subissue: Waste classification
Comment:

Section III.A.5.j. [48446] states that "Vanadium wastes such as P119 and P120 can be generated as a fly ash or slag from the iron and steel industry or as a spent catalyst from the chemical manufacturing process". U.S. Vanadium Corporation and others use these materials as one of the feedstocks for their vanadium processing and recovery facilities.

Since it is impossible for P119 and P120 to be generated as a fly ash or slag and still be a 261.33(a) or (b) commercial chemical product, it is not clear whether this fly ash or slag from the iron and steel industry is to be included under these proposed regulations. If the intention is to include them, we request that such fly ash and slag be excluded from the regulations when they are to be recycled for recovery of their vanadium values. We note at 40CFR 261.4(b)(4) that similar fly ash and slags from the combustion of fossil fuels are excluded from being hazardous wastes. These materials may also be used by U.S. Vanadium as a feedstock to their vanadium processing facility when the vanadium grade warrants.

In its November, 1989 proposed Best Demonstrated Available Technology (BDAT) Background Document for P119 and P120, the Agency states (page 2-6) that "The use of vanadium compounds as catalysts is expected to generate the greatest vanadium waste volumes", and further, "The Agency expects that most of these operations would be able to ship the spent catalyst to reclaiming operations for recovery". We certainly agree that recovery of vanadium from catalyst is feasible by U.S. Vanadium Corporation and others as long as it is not regulated as a RCRA waste. Some contend these catalysts are not regulated because they are recycled or the vanadium pentoxide is not the "sole active ingredient" as referred to in the comments following 40CFR 261.33(d). To clairify this issue, we request that vanadium bearing catalysts be specifically exempted from regulation when they are to be recycled for recovery of vanadium.

Comment Number: 13-B-2
Docket Number: LD12-00271
Commenter: Stratcor
Issue: Vanadium
Subissue: Waste Classification
Response:

The Agency agrees that fly ash or slag does not meet the definition of a 40 CFR 261.33 commercial chemical product. The proposed preamble statement to the contrary was a mistake. It was never the intention of the Agency to include such fly ash or slag in these regulations, therefore, the requested exclusion from these regulations is unnecessary.

Likewise, the Agency agrees with the contention that spent catalysts do not meet the definition in 40 CFR 261.33 of a commercial chemical product (i.e., it is not a substance consisting of the commercially pure grade of chemical, not a technical grade of the chemical, nor is it a formulation in which the chemical is the sole active ingredient). Spent catalysts, therefore, are not subject to the land disposal restrictions for P119 and P120 so an exemption from these regulations is unnecessary.

Comment Number: 13-C-1
Docket Number: LD12-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment Standard
Comment:

EPA proposes a treatment standard for P119 and P120 wastewaters of 0.042 mg/l based on the total composition of vanadium. See 54 Fed. Reg. at 48,466. This level cannot be achieved or detected and therefore should be substantially increased.

EPA discusses the fact that it does not have specific data for P119 and P120 wastewaters, and that wastewater treatment data from the Office of Water 2/ could not be reviewed in time for this proposed rulemaking. See 54 Fed. Reg. at 48, 466. In the absence of applicable treatment data, the Agency, without any discussion of the source, proposes to establish a treatment standard of 0.042 mg/l for these vanadium wastewaters.

This 0.042 mg/l proposed level is well below the level of detection. EPA has concluded that the level of detection for vanadium in these wastewaters is 0.1 mg/l. See EPA's Combined Metals Database, Administrative Record for Nonferrous Metals Phase II Effluent Guidelines Rulemaking, page 36,919-20 (Sept. 1985).

2/ We would like to emphasize that the treatment data in the Combined Metals Database used in the Nonferrous Metals Effluent Guidelines Rulemaking is excessively conservative. Vanadium was not present in the wastestreams at the facility from which EPA developed the vanadium treatment standard. Additionally, the Combined Metals Database does not account for the fact that natural calcination and/or silication of metals will occur and will reduce the impact of leachate from a land disposal site.

Comment Number: 13-C-1
Docket Number: LD12-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment Standard
Response:

As was explained in the Proposed BDAT Background Document for P119 and P120, the Agency used data collected from EPA's Office of Water to calculate the wastewater treatment standard of 0.042 mg/l. These data were included in the Proposed BDAT Background Document for Wastewaters Containing BDAT List Constituents USEPA, 1989c) and were referenced in the proposed P119 and P120 background document.

As was explained in the proposed wastewater background document on page 4-248, the specific data that were used to calculate the wastewater treatment standard were obtained from the Water Engineering Research Laboratory (WERL). The WERL data, in fact, supported the conclusion that chemical precipitation could achieve a level of 0.003 mg/l. The data used reflected the performance of full scale chemical precipitation of a waste stream containing a high concentration of vanadium (1000-10,000) ppb). However, upon reexamination of the data, EPA has concluded that the effluent value may have been the result of dilution.

The commenter asserts, based on information from the Combined Metals Data Base, that the level of detection for vanadium is 0.1 mg/l. The Agency does not agree that this is the detection limit in all cases. It is obvious from the data presented in the proposed wastewater background document that the level of detection for vanadium can be below this level.

Having said all this, however, the Agency has recalculated the final wastewater treatment standard (28 mg/l) based on data submitted as confidential business information from the treatment of a routinely

Comment Number: 13-C-1 (continued)

Docket Number: LD12-00187

Commenter: CMA

Issue: Vanadium

Subissue: Treatment Standard

Response:

generated vanadium wastewater stream. The Agency decided to use these data because, in part, of this comment and another comment similar to this one stating the 0.042 mg/l level is unattainable. EPA believes that this routinely generated stream is similarly or more difficult to treat than P119 and P120 wastewaters.

Comment Number: 13-C-2
Docket Number: LD12-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment standard
Comment:

Moreover, we are unaware of any demonstrated treatment that can achieve the proposed low level for these vanadium compounds. Unfortunately, there are little wastewater treatment data available. This is probably because there is not much production of these vanadium compounds in the United States. Additionally, vanadium pentoxide is soluble and ammonium vanadate disassociates in water.

Comment Number: 13-C-2
Docket Number: LD12-00187
Commenter: CMA
Issue: Vanadium
Subissue: Treatment Standard
Response:

For the proposed wastewater standard, the specific data that were used to calculate the wastewater treatment standard were obtained from EPA's Water Engineering Research Laboratory (WERL). The WERL data, in fact, supported the conclusion that chemical precipitation could achieve a level of 0.003 mg/l. The data used reflected the performance of full scale chemical precipitation of a waste stream containing a high concentration of vanadium (1,000 to 10,000 ppb). However, upon reexamination of the data, EPA has concluded that the effluent value may have been the result of dilution.

EPA has revised the wastewater treatment standard based on data submitted as confidentail business information during the comment period. The promulgated wastewater standard is 28 mg/l based on the solvent extraction of a routinely generated vanadium wastewater stream that the Agency believes is similarly or more difficult to treat than P119 or P120 wastewaters.

Comment Number: 13-C-3
Docket Number: LD12-00271
Commenter: Stratcor
Issue: Vanadium
Subissue: Treatment Standard
Comment:

The proposed development document referred to above states in Section 3.1.2 that "A common precipitating agent used for removal of vanadium from wastewaters is ferric sulfate which is added with pH adjustments. By treating with ferric sulfate, the vanadium is removed from the wastewaters as ferric metavanadate." From this information and data given in the USEPA October, 1989 document entitled proposed Best Demonstrated Available Technology (BDAT) Background Document for Wastewaters Containing BDAT List Constituents, the conclusion is drawn that the BDAT Treatment Limit Standards for P119 and P120 Wastewaters should be 0.042 mgV/l maximum for a 24-hour composite.

A review of the data in the October, 1989 document (page 4-250) indicates that a single data point from facility 245B was used to develop the wastewater concentration. Because no specific details were provided, we have no knowledge if this single example is applicable to P119 and P120 materials. We do have a good basic understanding and much experience with vanadium chemistry and find that the proposed limit is 100 to 1000 times less than we would expect. We doubt that reduction of vanadium levels to 0.042 mg/l in wastewater by addition of ferric sulfate is a "common" practice. We know of a facility where ferric iron was used to precipitate vanadium, but the effluent level of soluble vanadium was in the order of 1000 mgV/l. This process was only possible because the iron was already in solution and no additional iron was needed. A second process added ferrous sulfate to precipitate vanadium from an ammonium sulfate solution containing no iron. This process was abandoned because it was impractical, uneconomical and could not reduce the vanadium to acceptable levels below about 500 to 1000 mgV/l.

We regret that we find the proposed limit so unacceptable because it appears unreasonable. Prior to your deadline of May 8, 1990 we hope to have time to review existing data and develop a specific practical proposal. During the interim, we request that you hold the level in abeyance until a more reasonable value can be developed.

Comment Number: 13-C-3

Docket Number: LD12-00271

Commenter: Stratcor

Issue: Vanadium

Subissue: Treatment Standard

Response:

The Agency received data during the public comment period that were used to revise the proposed wastewater standard and to establish a final wastewater treatment standard of 28 mg/l. The data were based on the performance of solvent extraction of a vanadium wastewater. These data were submitted as Confidential Business Information; thus, it was not distributed for further comment. The Agency is confident that this standard is achievable by well-designed, well-operated treatment technology.

Comment Number: 13-D-1

Docket Number: LD12-00187

Commenter: CMA

Issue: Vanadium

Subissue: Data Submission

Response:

The Agency is not promulgating the proposed treatment standard of 0.042 mg/l. Instead a treatment standard of 28 mg/l is being finalized based on the performance of a proprietary wastewater treatment process on vanadium wastewater.

The Agency was unable to use the data that were submitted by the commenter (these data can be found in the RCRA LD12 docket as comment number 00187). It could not be used because the data in the submission were for a proprietary vanadium recovery intermediate process stream. This intermediate stream is not meant to represent final treatment of vanadium containing wastewaters, hence, it is entirely possible that if this process stream were a wastewater, that additional treatment would have reduced vanadium concentration further.

Comment Number: 13-E-1

Docket Number: LD12-00116

Commenter: Monsanto

Issue: Vanadium

Subissue: Empty containers

Comment:

EPA Should Provide An Incineration Alternative for P119 & P120 Non-Wastewaters

The Agency is proposing thermal recovery or stabilization as BDAT methods for P119 and P120 non-wastewaters. While this is based apparently on very limited data on thermal recovery (of non-wastewaters over 7% vanadium) and apparently no data on stabilization, we commend the Agency in its search for viable BDAT options. Monsanto supports the availability of the aforementioned BDAT options, but believes the Agency should also allow incineration as a BDAT option for specific wastes.

40 CFR 261.33(c) provides that certain containers or container liners from the shipment of ammonium metavanadate and vanadium pentoxide as commercial chemical products may become P119 or P120 hazardous wastes. Thermal recovery of the vanadium in these wastes is impractical because of low quantities present, and stabilization is not feasible because the material is often primarily plastic, cardboard, or wood. Such materials are now often incinerated. This is a viable treatment option because the volume reduction is very great, and the amount of vanadium added to incinerator ash is negligible so that stabilization of ash is not warranted. We urge the Agency to define a subcategory of such contaminated non-wastewater materials and to allow incineration as BDAT treatment.

Comment Number: 13-E-1
Docket Number: LD12-00116
Commenter: Monsanto
Issue: Vanadium
Subissue: Empty Containers
Response:

The Agency is promulgating a treatment standard of stabilization as a method of treatment for P119 and P120 nonwastewaters. The commenter asserts that because certain containers or container liners from the shipment of P119 and P120 are not amenable to the proposed treatment standard theremal recovery, a separate treatability group should be set up with a treatment standard expresssed as Incineration.

The commenter is reminded that he may triple rinse the containers in accordance with 40 CFR 261.7, resulting in a nonhazardous waste (however, the wastes removed from the container are considered P119 and P120 wastewaters and must be treated accordingly). The Agency believes that it is unlikely that a container from the shipment of P119 and P120 could not be triple rinsed in accordance with 261.7, however, in the event that such a situation should exist, there are provisions in the final rule that would apply to "nonempty" containers from the shipment of U and P wastes.

The Agency does not agree that there is a need for a separate vanadium treatability group for such containers. The Agency is instead establishing a category of organic debris wastes for which incineration is specified as an allowable method of treatment (see preamble section III.A.3.a.(2)). Since these containers could be classified as organic debris, they may be incinerated as suggested by the commenter.

Comment Number: 13-E-1 (continued)

Docket Number: LD12-00116

Commenter: Monsanto

Issue: Vanadium

Subissue: Empty Containers

Response:

The commenter states, however, that there is no need to stabilize the ash residue from incineration of such wastes. The Agency disagrees. The treatment standard for organic debris includes a requirement that such ash be stabilized prior to land disposal.

Comment Number: 13-E-2

Docket Number: LD12-00179

Commenter: DOW

Issue: Vanadium Empty Containers

Subissue:

Comment:

XXXI. THE AGENCY SHOULD ESTABLISH A TREATMENT TECHNOLOGY OF INCINERATION FOR LOW LEVEL CONTAMINATION FROM P119 AND P120 WASTES.

54 Fed. Reg. 48,446

The Agency is being unnecessarily restrictive in establishing a technology standard of thermal recovery or stabilization for all P119 and P120 wastes. The Dow Chemical Company generates small amounts of P120 listed waste as a result of the listing carry through for liners from containers which have held P-listed commercial chemical products. Dow uses solid vanadium pentoxide which is packaged in plastic. This plastic liner is currently incinerated since it is minimally contaminated and the plastic is amenable to incineration. Stabilization of this waste is neither practical nor more protective of human health or the environment, yet there is not enough vanadium pentoxide present to make thermal recovery a viable option. The Agency should recognize cut-off levels for vanadium wastes which are not amenable to recovery and allow thermal destruction as a method for treatment of these low level vanadium wastes.

Comment Number:	13-E-2
Docket Number:	LD12-00179
Commenter:	Dow
Issue:	Vanadium
Subissue:	Empty Containers
Response:	

The Agency is promulgating a treatment standard of stabilization as a method of treatment for P119 and P120 nonwastewaters. The commenter asserts that because certain containers or container liners from the shipment of P119 and P120 are not amenable to the proposed treatment standard theremal recovery, a separate treatability group should be set up with a treatment standard expresssed as Incineration.

The commenter is reminded that he may triple rinse the containers in accordance with 40 CFR 261.7, resulting in a nonhazardous waste (however, the wastes removed from the container are considered P119 and P120 wastewaters and must be treated accordingly). The Agency believes that it is unlikely that a container from the shipment of P119 and P120 could not be triple rinsed in accordance with 261.7, however, in the event that such a situation should exist, there are provisions in the final rule that would apply to "nonempty" containers from the shipment of U and P wastes.

The Agency does not agree that there is a need for a separate vanadium treatability group for such containers. The Agency is instead establishing a category of organic debris wastes for which incineration is specified as an allowable method of treatment (see preamble section III.A.3.a.(2)). Since these containers could be classified as organic debris, they may be incinerated as suggested by the commenter.

Comment Number: 13-E-2 (continued)
Docket Number: LD12-00179
Commenter: Dow
Issue: Vanadium
Subissue: Empty Containers
Response:

The commenter states, however, that there is no need to stabilize the ash residue from incineration of such wastes. The Agency disagrees. The treatment standard for organic debris includes a requirement that such ash be stabilized prior to land disposal.

ISSUE CODE 14: P and U Wastes Containing Thallium

A.-. Data Submission

Comment Number: 14-A-1
Docket Number: LD12-00050
Commenter: HWTC
Issue: Thallium
Subissue: Data Submission
Response:

The Agency is setting a technology-based standard because the only thallium nonwastewater stabilization data available are inconclusive in setting a concentration-based standard. These thallium stabilization data contained no untreated TCLP concentrations and the data points differed by more than two orders of magnitude with no explanation given.

Comment Number: 14-A-2
Docket Number: LD12-00050
Commenter: HWTC
Issue: Thallium
Subissue: Data Submission
Response:

These data that were received from the commenter support that stabilization works for thallium wastes.